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StarQuality

User Manual

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Document History

Changed Item	Description	Date
This is the first release	Version 1.0	December 2008
General	Version 1.5 - Changed to reflect multiple server group sites. Added the following chapters: ■ Network Discovery ■ Setting Alarm Thresholds ■ Reports	February 2009
Introduction	Moved Counters for BreezeMAX from Introduction to Chapter 4 “Viewing Measurements”	February 2009
Installation	Added licence loading steps.	February 2009
Settings	Moved topics into relevant chapters.	February 2009
General	Added Solaris information Added 4Motion to the supported equipment	Ver. 2.0 June 2009
Introduction	Data Structure - Hierarchy changed	
Installation	Added installation on Solaris Added upgrade for Windows installation	
Getting Started - Operations and Navigation in the Hierarchy	Hierarchy changed Activating SOAP server - new	
Viewing Measurements	Added 4Motion set of discovery measurements; screenshorts changed	
Setting Alarm Thresholds	Added 4Motion information	
NBI	New Chapter	
Reports	Chapter modified	
Installation	Added Linux as an optional OS	
Measurements	Changed measurement definitions Added search feature for text including spaces Added Operations drop-down menu options	
General	Added BreezeACCESS VL support information	Ver.2.5 December 2009
Installation	Added Oracle patch installation	Ver.2.5 December 2009

Changed Item	Description	Date
Introduction	Added 4Motion ver.3.0 and BreezeMAX Extreme to the supported equipment list. Deleted Deployment Scenarios	Ver.3.0 June 2010
Installation	Revised structure	Ver.3.0 June 2010
Getting Started	"Operations and Navigation in the Hierarchy" on page 115 - Removed the Link option (for Alarms and Measurements)	Ver.3.0 June 2010
Network Discovery	Added 4Motion and BreezeMAX Extreme information. Modified Prerequisites Generally revised	Ver.3.0 June 2010
Reports	Added 4Motion and BreezeMAX Extreme information.	Ver.3.0 June 2010
Setting Alarm Thresholds	Moved all syntax tables to Chapter 11	Ver.3.0 June 2010
Chapter 11, Device Specific Information	New Chapter, including information per device type	Ver.3.0 June 2010

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About this Manual

The StarQuality User Manual comprises the following chapters:

Chapter 1- Introduction - provides an overview of the StarQuality system and its functionality.

Chapter 2 - Installation - describes how to install and uninstall the StarQuality application and use commands to start and stop it.

Chapter 3 - Getting Started - describes the structure of the interface windows, logging in, general display options, searching, the menu system, operations and navigation, and editing of objects,

Chapter 4 - Network Discovery - describes the creation of a WiMAX network and all the BTSs under it. In addition, it describes the creation of a utility network.

Chapter 5- Viewing Measurements - describes browsing options, display options, viewing measurement data, searching measurements and saving items as a submenu.

Chapter 6 - Setting Alarm Thresholds - describes how to create threshold templates and assigning them to equipments.

Chapter 7 - Threshold Crossing Alarms - describes the alarms and how to navigate, view and filter them. It also explains how to download data to Excel files.

Chapter 8 - Reports - Setting and viewing reports.

Chapter 9 - General Setting Options - describes how to set the site and equipment configuration, thresholds, customizing, server configuration and management, audit trail and user administration.

Chapter 10 - Northbound Interface (NBI) - describes the StarQuality Northbound Interface (NBI) functionality

Chapter 11 - Device Specific Information - contains details about software compatibility, traffic and performance counters, codes for thresholds and default built-in reports

Glossary - Explanation of commonly used terms

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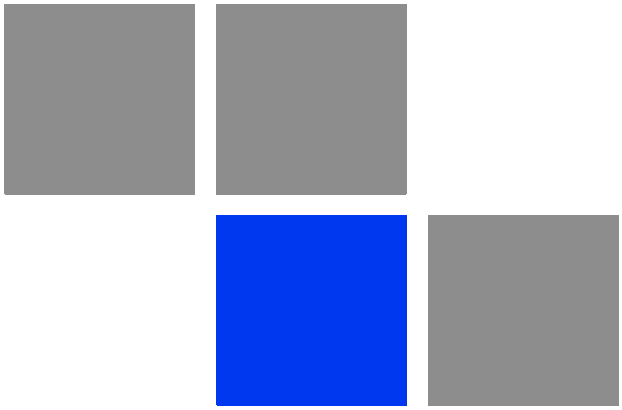
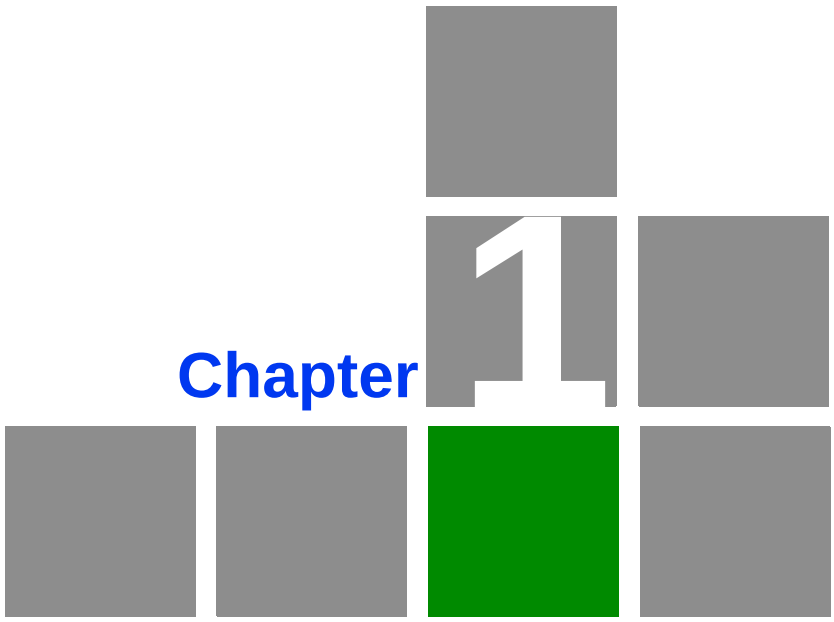




Chapter 1

Introduction

In this chapter:

- “System Overview” on page 3
- “System Data Structure” on page 5
- “System Data Structure” on page 5
- “User Types and Their Settings” on page 6

1.1 System Overview

1.1.1 General

Alvarion's StarQuality is a carrier-class performance and traffic monitoring system designed for optimizing the WiMAX Network performance, identifying network problems, maximizing traffic capacity and optimizing resource allocation. StarQuality offers an end-to-end performance solution including collection, analyzing, storing and displaying of the performance data. The system provides a unified performance application for monitoring Alvarion's WiMAX equipment as well as server health.

StarQuality provides various sets of report types and lists through an intuitive and simple Web-GUI client. It also enables defining TCA (Threshold Crossing Alerts) mechanism: an alarm generation may be conditional to the occurrence of several rule violations.

Alvarion's StarQuality is an essential element for optimizing the WiMAX Network functionality, radio planning, ensuring service performance and problem identification.

1.1.2 STAR Management Suite Overview

Alvarion's STAR Management Suite offers complete and comprehensive management solution for ensuring the successful deployment of WiMAX services. The Alvarion STAR Management Suite offers a set of carrier class management tools, each tool designed to fulfill a certain management purpose.

The STAR Management Suite includes:

- **AlvariSTAR** - Carrier-class Management System for managing Alvarion's WiMAX Base Stations.
- **StarACS** - An Automatic Configuration Server (ACS) for managing end-user Fixed and Nomadic devices (CPE) based on TR-69 protocol. StarACS is relevant only for WiMAX 16e Networks.
- **StarQuality** - Performance monitoring system for optimizing the WiMAX network.
- **StarReport** - Powerful report generator for generating network inventory reports.

1.1.3 Supported Equipment

1.1.3.1 WiMAX

- BreezeMAX FDD ver.3.5/3.6 (FDD SNMP) - Micro and Macro BTS
- BreezeMAX FDD ver.3.7 (FDD TFTP) - Micro and Macro BTS
- BreezeMAX TDD ver.4.5 and later (TDD TFTP) - Macro BTS only
- 4Motion ver.2.5M and 3.0
- BreezeACCESS VL ver.6
- BreezeMAX Extreme ver.1.5

1.1.3.2 Server Health

- AlvariSTAR ver4.0 and up
- Oracle database server
- UNIX OS

1.2 System Data Structure

The basic entities comprising the StarQuality network are:

- Equipment - also referred to as the device:
  - BTS (Base Transceiver Station) and SU for WiMAX networks
  - AlvariSTAR, Oracle database server and UNIX machine for Server Health.

  Each piece of equipment belongs to a site.
- Basic sampled unit:
  - SU, Slot/BS (*n* times in each BTS) for WIMAX networks, BTS for common measurements
  - AlvariSTAR, Oracle database server and UNIX machine for Server Health.
- Site – collection of equipments and/or sites. Each site can contain arbitrary many sites and equipment. Each site can reside below another site.
- Root – a virtual site – collection of sites only

A bare System contains only ROOT.

1.3 User Types and Their Settings

In the StarQuality, different users can have different access rights to various objects. There is always an administrator user (admin) with the highest permission level. The individual user groups are:

- **admin user:** The user named *admin* possesses all the rights, but cannot configure preferences, and cannot create a private virtual hierarchy and charts. The default password is admin123 at installation. This user cannot be deleted from the system.

- **Administrator:** has the same rights as the *admin* user, except:

  - Cannot create, modify and delete administrator users
  - Cannot create, modify and delete servers or server groups, cannot view the operating system level user password on some computers
  - Cannot change and view the actual licences used
  - Can set preferences, and create a private virtual hierarchy and charts

- **Restricted administrators:** similar to the normal users they can only view those objects that they have received privileges for. However the restricted administrators can modify these objects:

  - Only those site, equipment, measurement, threshold, threshold type and exclusion window objects for which they have received privileges
  - Can only modify a user if it was created by themselves
  - Can only view an entry in the audit log if the change was made by themselves
  - Can only modify a public virtual hierarchy object or a public chart if it was created by themselves
  - Cannot modify templates (except the exclusion windows), reports, servers, events and maps

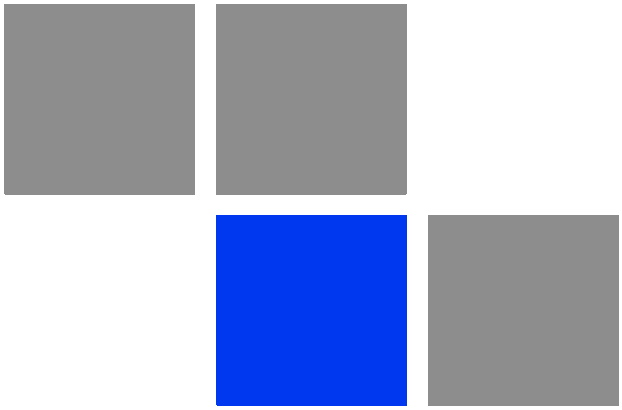
- **Normal users:** cannot modify the base objects in the system, and can view only those objects that they have received privileges for. They can set

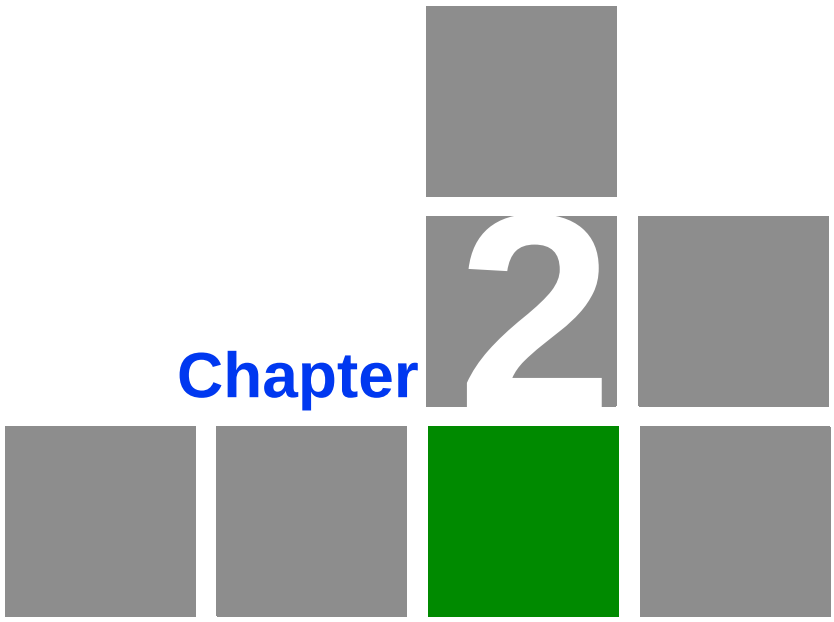
preferences, create private virtual hierarchies and charts, and can modify their own passwords

- **Limited users:** Similar to normal users, but they cannot change their passwords, cannot set preferences, and cannot create private virtual hierarchies and charts

Any administrator has the right to modify normal users, while only the admin user can modify administrators. Restricted administrators cannot modify a user except if it was created by themselves. No user can delete the admin user.

For further information, refer to the “User Administration (Admin only)” on page 261.





Chapter 2
Installation

In this chapter:

- "Introduction" on page 10
- "Installing StarQuality on Windows Server with Internal Oracle Database" on page 13
- "Installing StarQuality on Windows Server with External Oracle Database on the Same Machine" on page 30
- "Installing StarQuality on Windows Server with Oracle Database on a Separate Machine" on page 46
- "Installing StarQuality on Solaris Server with Internal Oracle Database" on page 62
- "Installing StarQuality on Solaris Server with External Oracle Database on the Same Machine" on page 71
- "Installing StarQuality on Solaris Server with Oracle Database on a Separate Machine" on page 81
- "Running StarQuality on Windows" on page 90
- "Additional Installation Information" on page 95
- "StarQuality Upgrade" on page 100
- "Uninstalling StarQuality" on page 103

2.1 Introduction

2.1.1 Installation Types

StarQuality can be installed on systems with internal or external databases and on systems running Windows and UNIX-like operating systems. This chapter is divided into sections according to the type of operating system and type of database installation.

The following are possible installation types, depending on configuration:

- Installing StarQuality on Windows
  - » with internal Oracle Database
  - » with external Oracle Database on the same machine
  - » with Oracle Database on a separate machine
- Installing StarQuality on Solaris
  - » with internal Oracle Database
  - » with external Oracle Database on the same machine
  - » with Oracle Database on a separate machine

Before starting installation, refer to Table 2-1 below to determine which type of installation to use:

Table 2-1: Selecting Installation Types

Operating System	System Architecture	Oracle database server version	Oracle client version (installed on StarQuality machine)	Refer to
Windows 2008 Standard	**Internal database**	Oracle SW and patch supplied with StarQuality DVD	No Oracle client required	"Installing StarQuality on Windows Server with Internal Oracle Database" on page 13
	External database on same machine	*Version supplied with StarQuality DVD (10203_vista_w2k8_x86_production_db)		"Installing StarQuality on Windows Server with External Oracle Database on the Same Machine" on page 30
	External database on a separate machine		10203_vista_w2k8_x86_production_client	"Installing StarQuality on Windows Server with Oracle Database on a Separate Machine" on page 46
Solaris 10 x86	**Internal database**	Oracle SW and patch supplied with StarQuality DVD	No Oracle client required	"Installing StarQuality on Solaris Server with Internal Oracle Database" on page 62
	External database on same machine	*Version supplied with StarQuality DVD (10201_database_solx86_64)		"Installing StarQuality on Solaris Server with External Oracle Database on the Same Machine" on page 71
	External database on a separate machine		10201_client_solx86_64 or 10202_client_solx86	"Installing StarQuality on Solaris Server with Oracle Database on a Separate Machine" on page 81

* The Oracle kit included in the DVD covers the Oracle license only if it is installed together with StarQuality (internal database installation). In case of installing an external DB, purchase licence separately.

2.1.2 General Prerequisites

The following are general prerequisites for all installation types:

- The computer on which the server is installed must comply with hardware and software requirements as detailed in the Release Notes.

- The computer on which the StarQuality Server and/or Oracle database are installed must be dedicated to running these applications.
- The computers should have latest Operating System versions.
- The StarQuality application requires a minimum of 20 GB free disk space.
- Valid StarQuality license (required for initial activation after installation)

2.2 Installing StarQuality on Windows Server with Internal Oracle Database

Before beginning the StarQuality installation refer to Table 2-1 to ensure that this is the correct installation for your system, and perform all the tasks outlined in Section 2.2.1 below.

This installation type involves the installation of the following components:

- cygwin
- StarQuality

2.2.1 Pre-installation Tasks

2.2.1.1 Disk Partitioning

For medium network configurations, containing no more than 350 BTSs or 50,000 CPEs, disk partitioning is recommended, as described in the following table:

Table 2-2: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1	OS, StarQuality SW, Oracle SW
Physical disk 2	Volume 2 - RAID 0	Oracle tablespaces, redo logs, etc. (entire SID)
Physical disk 3		
Physical disk 4		

2.2.1.2 Configuring Network Ports

The following ports must be open between the server machine, client machine, managed network equipment and other NMS/OSS elements:

Table 2-3: Network Ports

Use	Port	Protocol	Direction
App. server and managed equipment	161	SNMP	Outbound towards NE
App. server, managed equipment and other NMS/OSS elements	162	SNMP	Outbound towards NMS/OSS elements
App. server and managed equipment	69	TFTP	From Managed equipment to StarQuality
App. server and client	8080		Inbound/Outbound between client and server
Sending requests to AlvariSTAR in order to reach KPI	16162	SNMP	

2.2.1.3 Installing Cygwin

Cygwin is a UNIX-like environment for Windows. StarQuality operation commands must always be executed from a cygwin window.

The Cygwin Installation files can be downloaded from the internet (see "To download and install Cygwin from the Internet:" on page 20), or Alvarion FTP Server (see below).

To download and install Cygwin from the Alvarion FTP server:

1. Download the *CygwinFromWwwGoh4Com.zip* file from ftp://downloads.alvarion.com/StarSuite/Star Quality/Installations/ (Username and password required when connecting as *alvarioncustomer*)
2. Extract the zip file into a folder with a path that does not include spaces.
3. From the extracted files run the *setup.exe* file; The Cygwin Net Release Setup Program window is displayed.

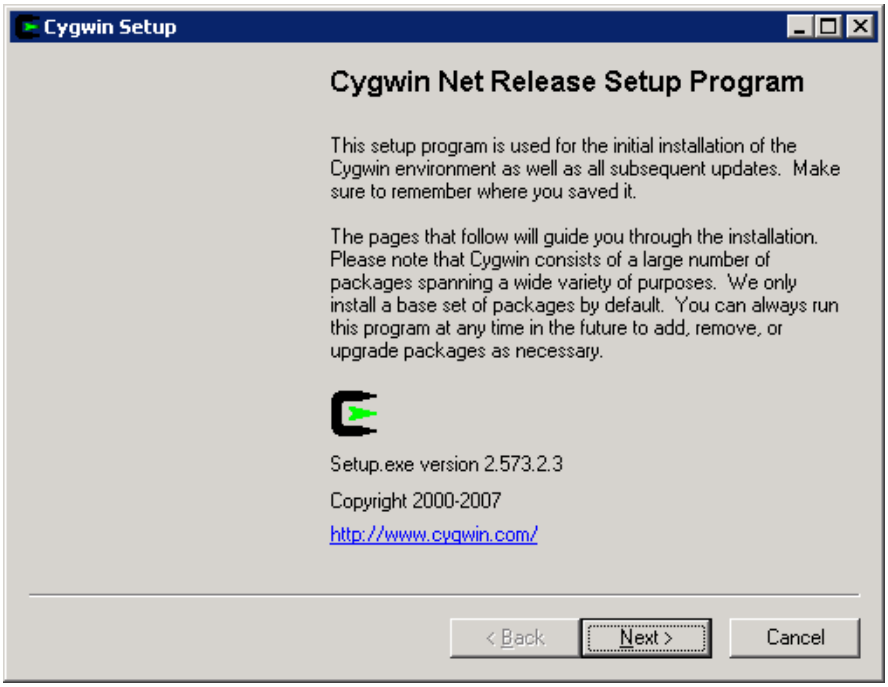

Cygwin Setup
Cygwin Net Release Setup Program
This setup program is used for the initial installation of the Cygwin environment as well as all subsequent updates. Make sure to remember where you saved it.
The pages that follow will guide you through the installation. Please note that Cygwin consists of a large number of packages spanning a wide variety of purposes. We only install a base set of packages by default. You can always run this program at any time in the future to add, remove, or upgrade packages as necessary.
Setup.exe version 2.573.2.3
Copyright 2000-2007
http://www.cygwin.com/
< Back
Next >
Cancel

Figure 2-1: Cygwin Net Release Setup Program window

4 Click **Next**. The Choose a Download Source window is displayed.

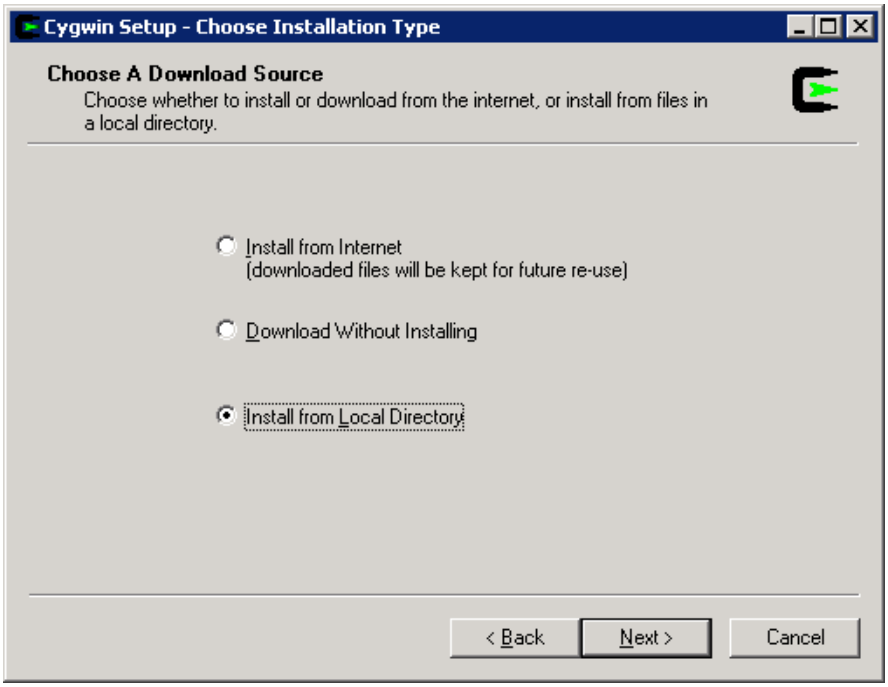

Cygwin Setup - Choose Installation Type
Choose A Download Source
Choose whether to install or download from the internet, or install from files in a local directory.
Install from Internet
(downloaded files will be kept for future re-use)
Download Without Installing
Install from Local Directory
< Back
Next >
Cancel

Figure 2-2: Choose a Download Source Window

5 Select Install from Local directory. Click **Next**.

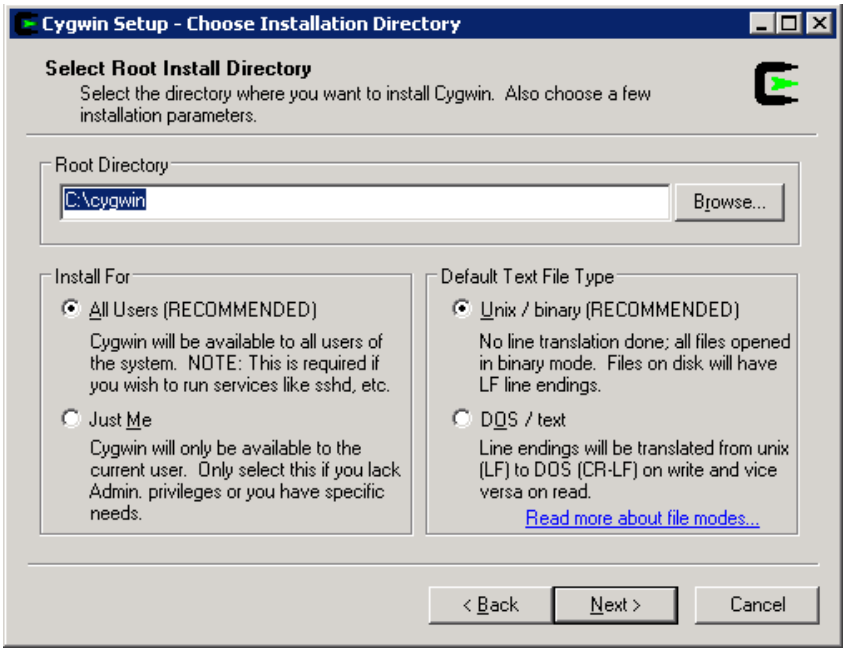

Cygwin Setup - Choose Installation Directory
Select Root Install Directory
Select the directory where you want to install Cygwin. Also choose a few installation parameters.
Root Directory
C:\cygwin
Browse...
Install For
All Users (RECOMMENDED)
Cygwin will be available to all users of the system. NOTE: This is required if you wish to run services like sshd, etc.
Just Me
Cygwin will only be available to the current user. Only select this if you lack Admin. privileges or you have specific needs.
Default Text File Type
Unix / binary (RECOMMENDED)
No line translation done; all files opened in binary mode. Files on disk will have LF line endings.
DOS / text
Line endings will be translated from unix (LF) to DOS (CR-LF) on write and vice versa on read.
Read more about file modes...
< Back
Next >
Cancel

Figure 2-3: Select Root Install Directory

6 Choose settings as recommended on screen. Verify that Root directory is a local drive. Click **Next**.

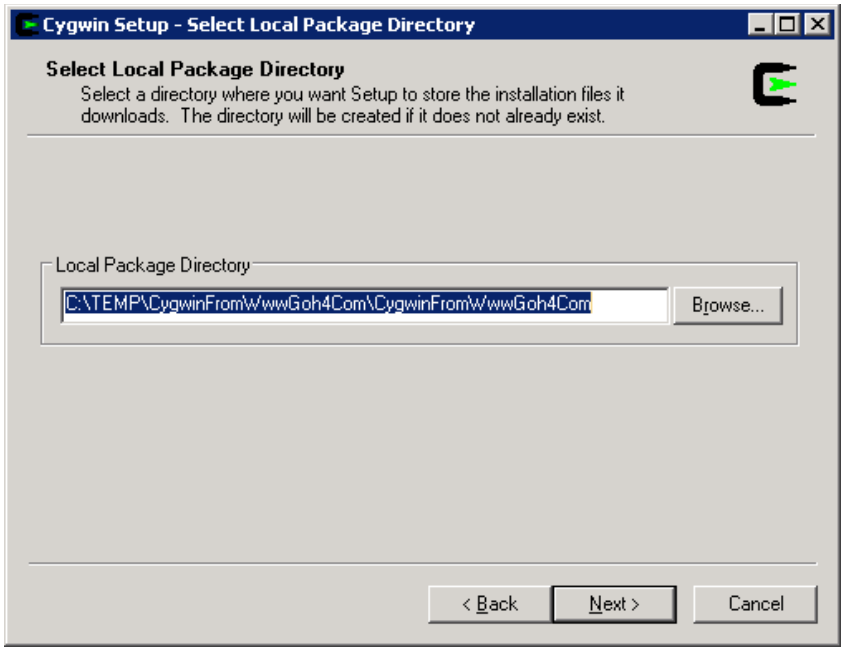

Cygwin Setup - Select Local Package Directory
Select Local Package Directory
Select a directory where you want Setup to store the installation files it downloads. The directory will be created if it does not already exist.
Local Package Directory
C:\TEMP\CygwinFromWwwGoh4Com\CygwinFromWwwGoh4Com
Browse...
< Back
Next >
Cancel

Figure 2-4: Select Local Package Directory

7 Verify that Local Package Directory is the correct path. Click **Next**; The Select Packages window is displayed.

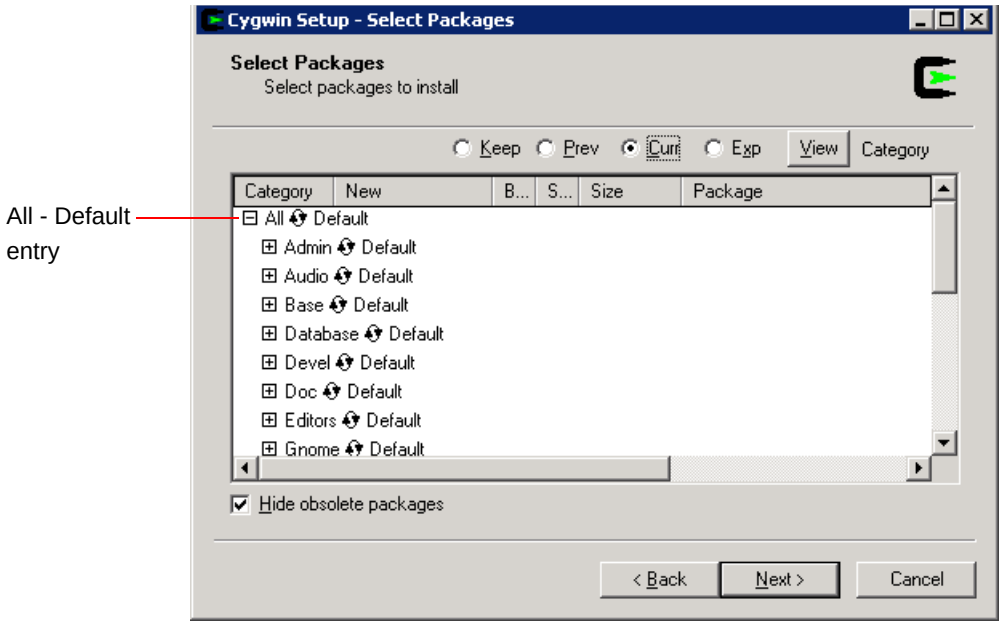


Figure 2-5: Select Packages Window - All Default (Initial State)

8 Click on the word "Default" in the main "All" entry (package) (see Figure 2-6) to change it to "Install".

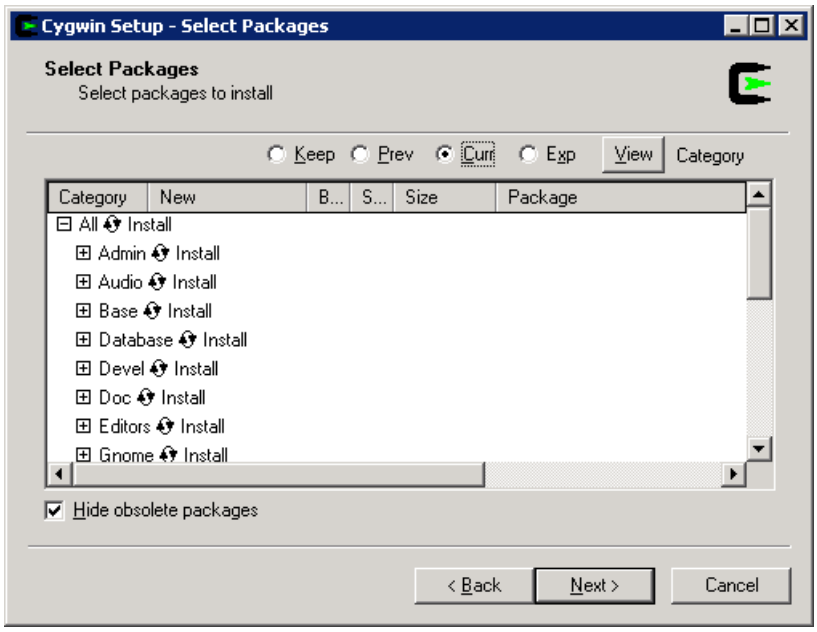


Figure 2-6: Select Packages Window - All "Install"

9 Verify that all the entries under the “All” main package have also been changed to “Install” (see Figure 2-7).

10 Scroll down to the Perl package and expand it using the + sign.

11 Check the sub-package under Perl. If it is other than 5.8.x.x (e.g. “skip”), click on it to change it to the required 5.8.x.x (see Figure 2-8).

NOTE

The Perl version must be 5.8.x.x, otherwise it does not meet the StarQuality requirements. In this case, use a different cygwin installation package.

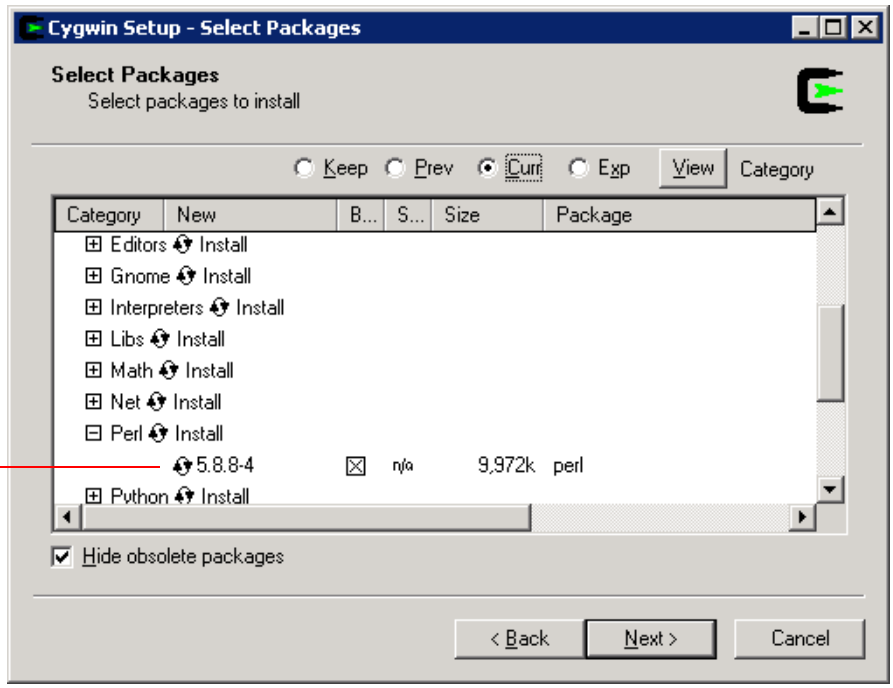


Figure 2-7: Select Packages Window - Perl Version

12 Click **Next**; the installation proceeds until completed.

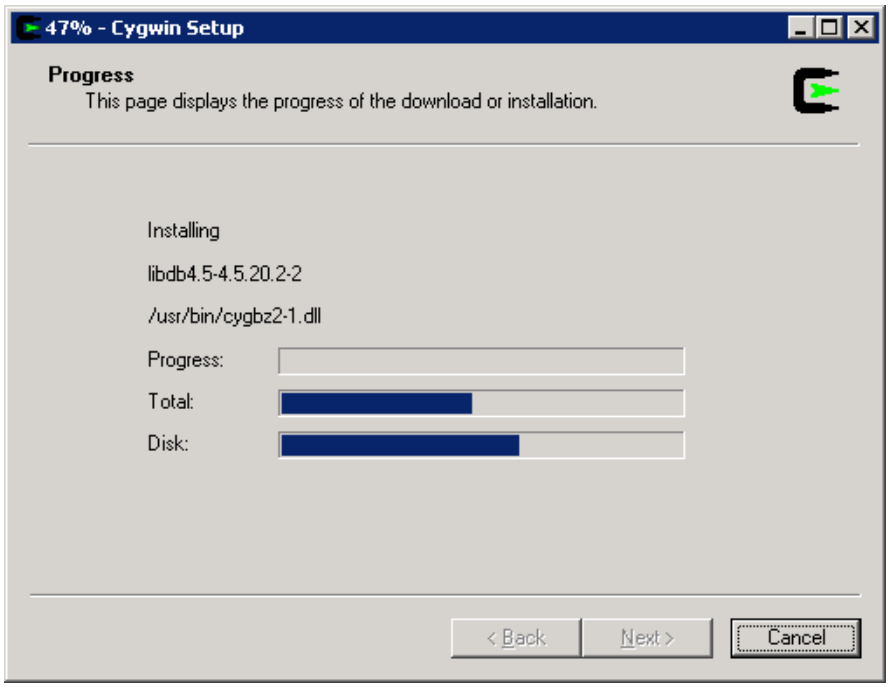


Figure 2-8: Cygwin Installation Process

13 Click **Finish**.

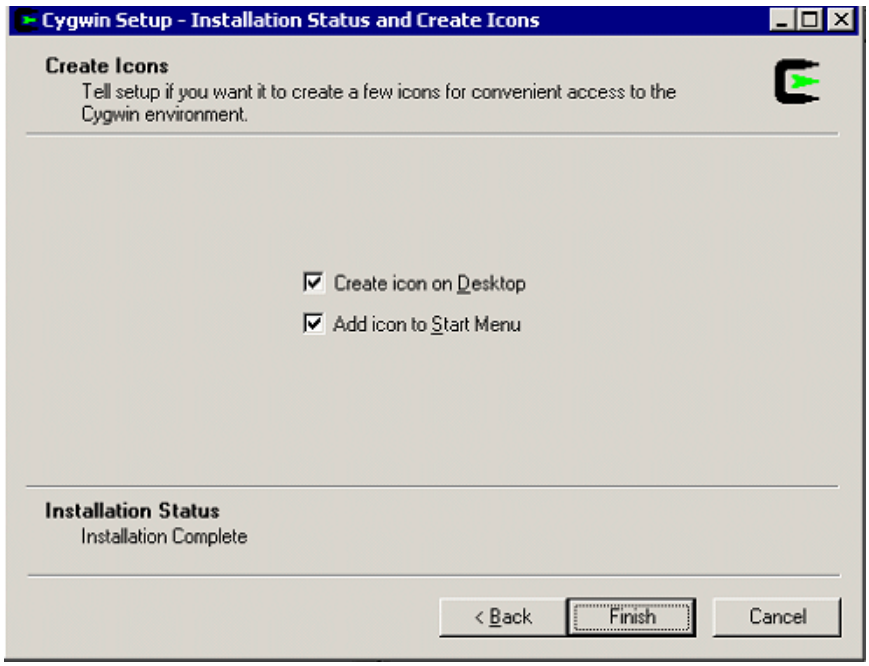

Cygwin Setup - Installation Status and Create Icons
Create Icons
Tell setup if you want it to create a few icons for convenient access to the Cygwin environment.
Create icon on Desktop
Add icon to Start Menu
Installation Status
Installation Complete
< Back
Finish
Cancel

Figure 2-9: Cygwin Installation Completion

To download and install Cygwin from the Internet:

Make sure the Cygwin version you download and use includes the following packages:

Sapache	base-files	base-passwd
bash	binutils	bzip2
coreutils	crypt	cygrunsrv
cygutils	cygwin	editrights
expat	findutils	gawk
gcc-core	gcc-g++	gcc-mingw-core
gcc-mingw-g++	grep	gzip
less	libbz2_1	libdb4.5
libexpat1	libexpat1-devel	libgdbm4
libiconv2	libintl3	libintl8
libncurses8	libpcre0	libpopt0
libreadline6	libwrap0	login
make	mingw-runtime	minires
openssh	openssl	perl - version 5.8.x.x
ping	sed	tar
termcap	terminfo	texinfo
tzcode	vim	w32api
which	zlib	

2.2.2 Installing StarQuality

2.2.2.1 Overview

This Installation type is applicable when Installing StarQuality on Windows server with internal Oracle database (refer to Table 2-1).

The installation has to be performed by a local administrator user.

During the installation the installer writes information into two destinations: the Details view and the log file. To display the Details view, click **Show Details** in the installation wizard. The log file is located in the *Temp* directory of the user (by default *C:\Documents and Settings\<USER>\Local Settings\Temp*).

2.2.2.2 StarQuality Installation Procedure

1 Ensure that the pre-installation task are complete as required in Section 2.2.1

2 Do one of the following:

» Insert the installation DVD into the DVD drive or

» Copy/unzip the Installation folder directly onto one of the disk drives (for example: *C:/*).

IMPORTANT

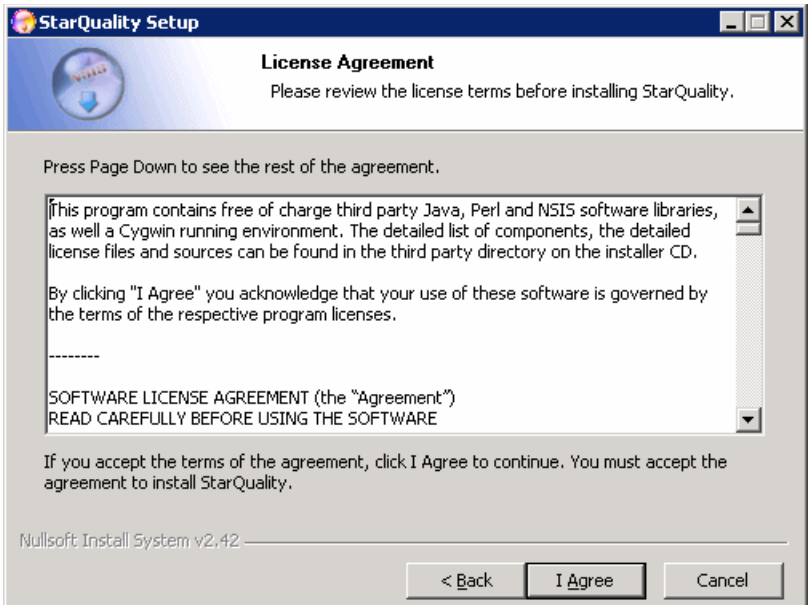
Do not place the installation files into a folder with a long path. This is an Oracle installer limitation.

3 Run the installation program *starquality.exe*; The installation wizard is displayed.

StarQuality Setup
Welcome to the StarQuality Setup Wizard
This wizard will guide you through the installation of StarQuality.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel

Figure 2-10: StarQuality Setup Wizard Window

4 Click **Next**; the wizard displays a license agreement. Please read the agreement carefully.


StarQuality Setup
License Agreement
Please review the license terms before installing StarQuality.
Press Page Down to see the rest of the agreement.
This program contains free of charge third party Java, Perl and NSIS software libraries, as well a Cygwin running environment. The detailed list of components, the detailed license files and sources can be found in the third party directory on the installer CD.
By clicking "I Agree" you acknowledge that your use of these software is governed by the terms of the respective program licenses.

SOFTWARE LICENSE AGREEMENT (the "Agreement")
READ CAREFULLY BEFORE USING THE SOFTWARE
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install StarQuality.
Nullsoft Install System v2,42
< Back
I Agree
Cancel

Figure 2-11: Licence Agreement

5 Click **Next**; the wizard displays components to install.

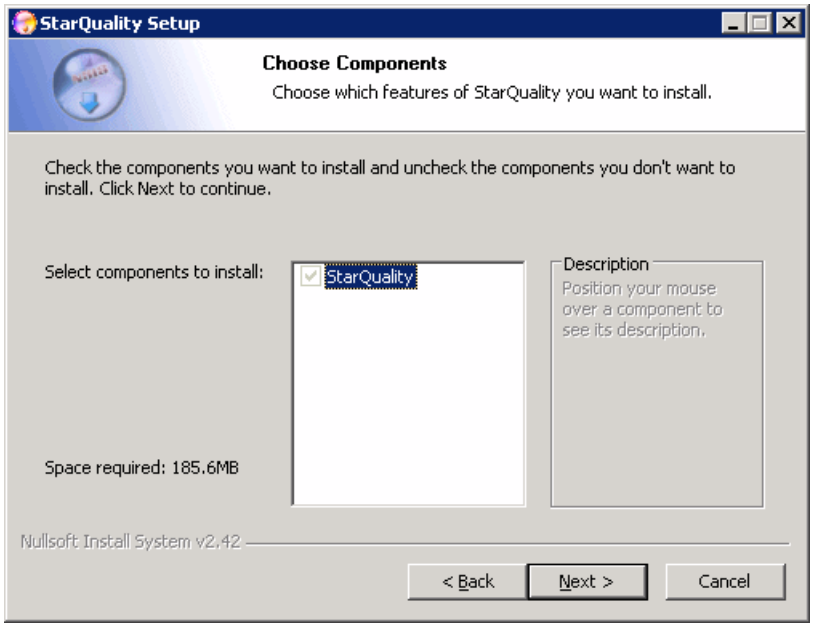

StarQuality Setup
Choose Components
Choose which features of StarQuality you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
Select components to install:
StarQuality
Description
Position your mouse over a component to see its description.
Space required: 185.6MB
Nullsoft Install System v2,42
< Back
Next >
Cancel

Figure 2-12: Choose Components

6 Click **Next**; StarQuality installation starts. To view detailed information click **Show Details**. The content of the details view can be copied to the clipboard.

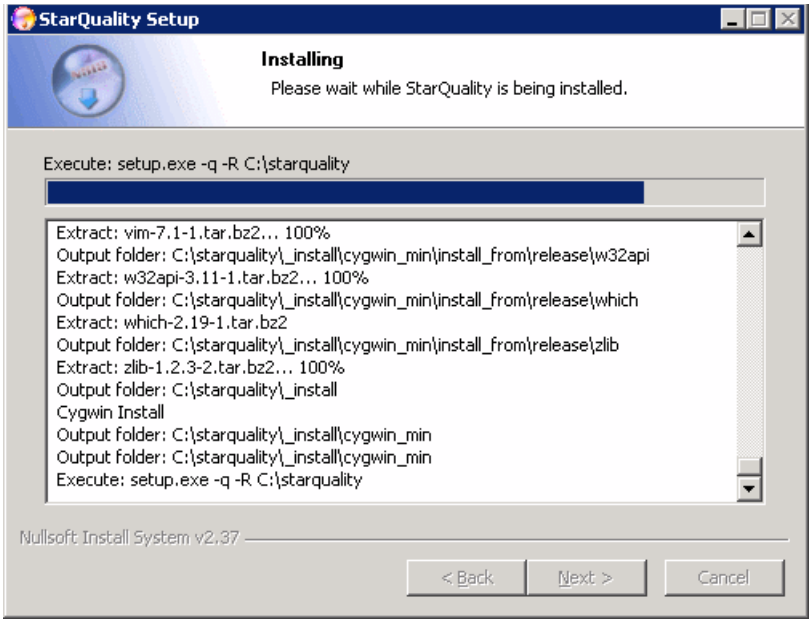


Figure 2-13: StarQuality Installing

The last page indicates that the basic installation is done.

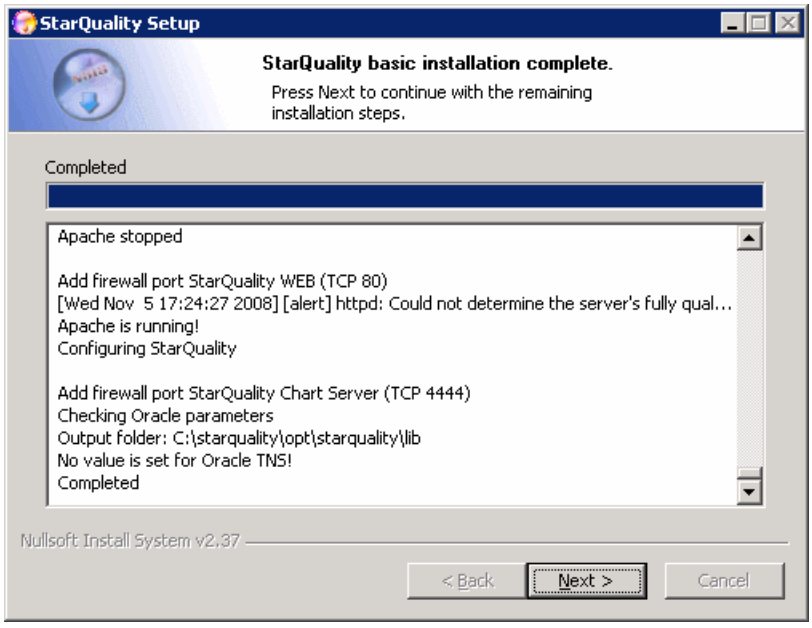

StarQuality Setup
StarQuality basic installation complete.
Press Next to continue with the remaining installation steps.
Completed
Apache stopped
Add firewall port StarQuality WEB (TCP 80)
[Wed Nov 5 17:24:27 2008] [alert] httpd: Could not determine the server's fully qual...
Apache is running!
Configuring StarQuality
Add firewall port StarQuality Chart Server (TCP 4444)
Checking Oracle parameters
Output folder: C:\starquality\opt\starquality\lib
No value is set for Oracle TNS!
Completed
Nullsoft Install System v2.37
< Back
Next >
Cancel

Figure 2-14: StarQuality Basic Installation Complete

7 Click **Next**; the installer prompts for the Oracle installation and patch, located on the StarQuality DVD (Figure 2-15). Proceed as follows:

a Select the Oracle installer folder: If required, click **Browse** and select the location for the files.

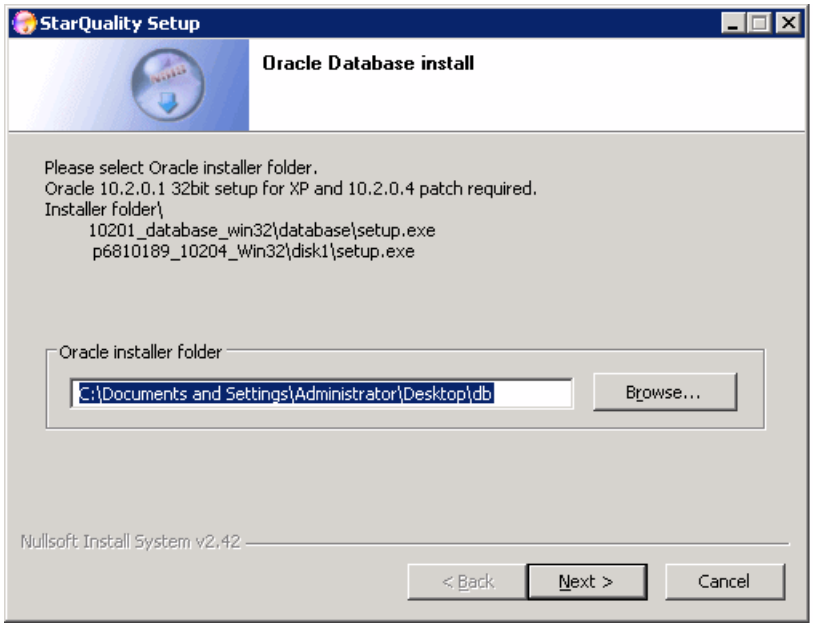


Figure 2-15: Oracle Database Install

b Click **Next**. The StarQuality Installation window is displayed (Figure 2-16) Click **Browse** to change the default Oracle home directory.

IMPORTANT

The Oracle home directory must be on the same disk drive as the StarQuality (Cygwin) home directory.

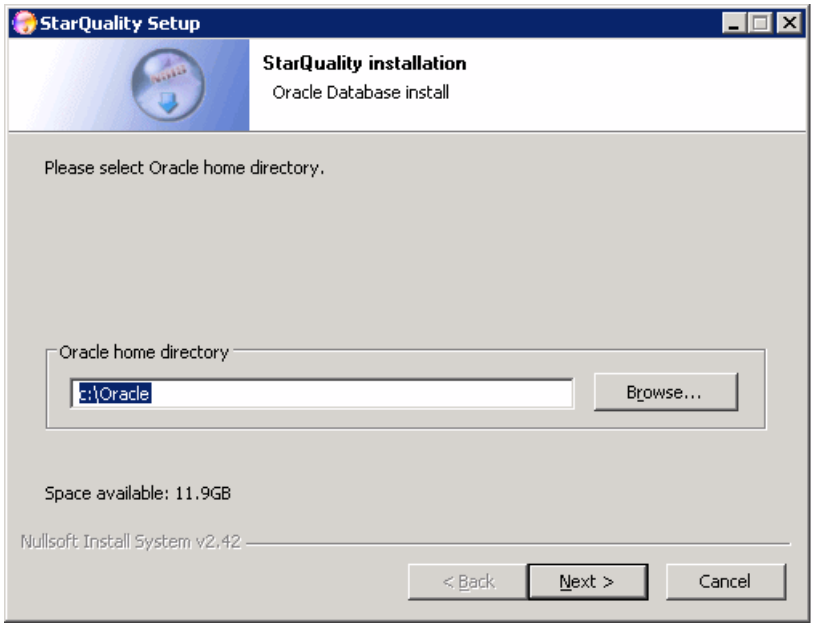


Figure 2-16: Oracle Directory

c Click **Next**. A command line window is displayed, showing the Oracle database installation progress (Figure 2-17).

NOTE

The Oracle database installation may take 30-60 minutes, depending on the machine characteristics. During the whole time, the installation progress is displayed in the console. If the console is idle for more than 10 minutes, check for errors.

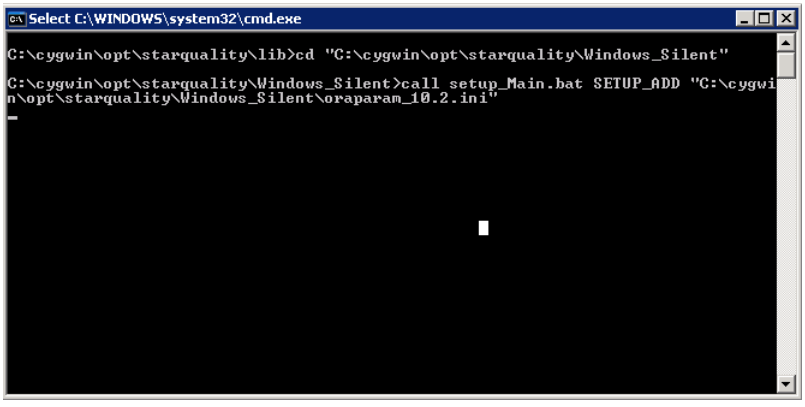


Figure 2-17: Installation Progress

8 Fill in and confirm the required password. It is recommended to use the Windows password for the same user.

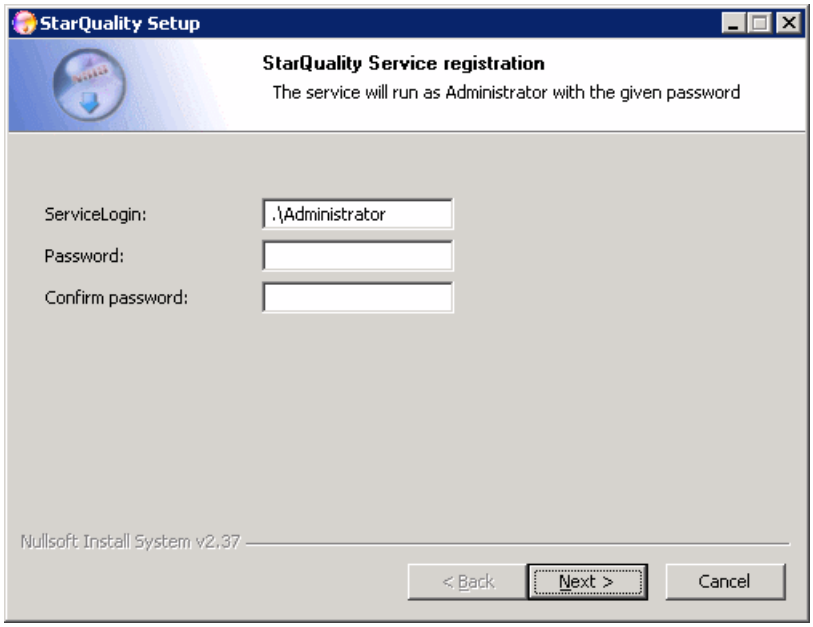


Figure 2-18: StarQuality Windows Service Registration

9 Click **Next**; The Oracle Connection page is displayed (Figure 2-19).

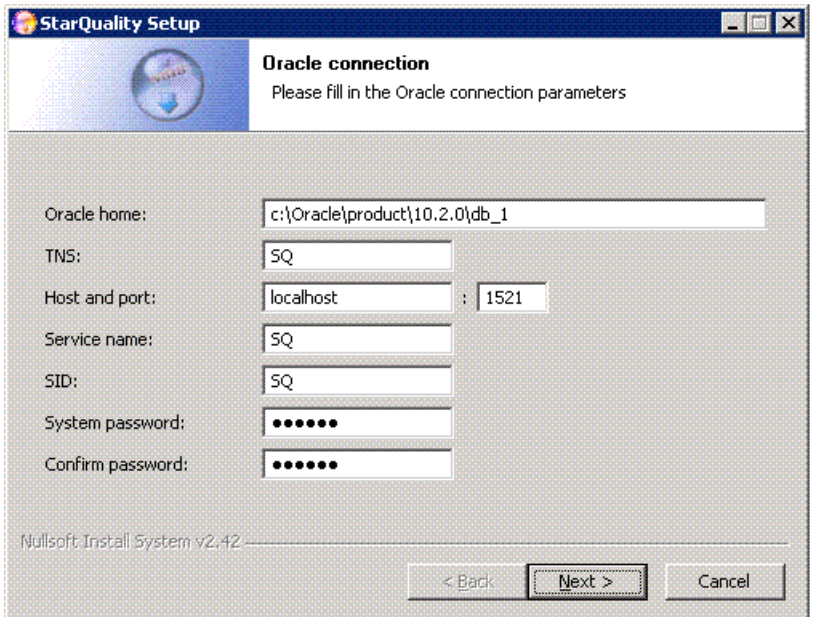


Figure 2-19: Oracle Connection Parameters

10 Verify that the correct values are filled in the following fields:

- **Oracle Home**: Path to the Oracle Home variable.

- **TNS:** the TNS name to be used for the database connection as appears in the *tnsnames.ora* file on the StarQuality machine. For internal Oracle: SQ.

- **Host and port:** the host of the Oracle database server and port used for connecting to it. Port default is 1521(For internal Oracle: 1521). Host can be either:

  - ”localhost”
  - Host name
  - IP
  - 127.0.0.1

- **Service name and SID:** only one of them needs to be filled in, preferably the Service name. For internal Oracle: SQ.

- **System password and Confirm password:** the password of the SYSTEM user in the database. For internal Oracle: oracle. The password is only used by the installer for the creation of the database user and table spaces, the installer does not save it.

11 Click **Next**; Oracle Connection continues with Oracle tablespace parameters. Point both CONF. and DATA tablespaces to the Oracle data computer partition cording to Table 2-2.

12 Approve the creation of CONF and DATA tablespaces.

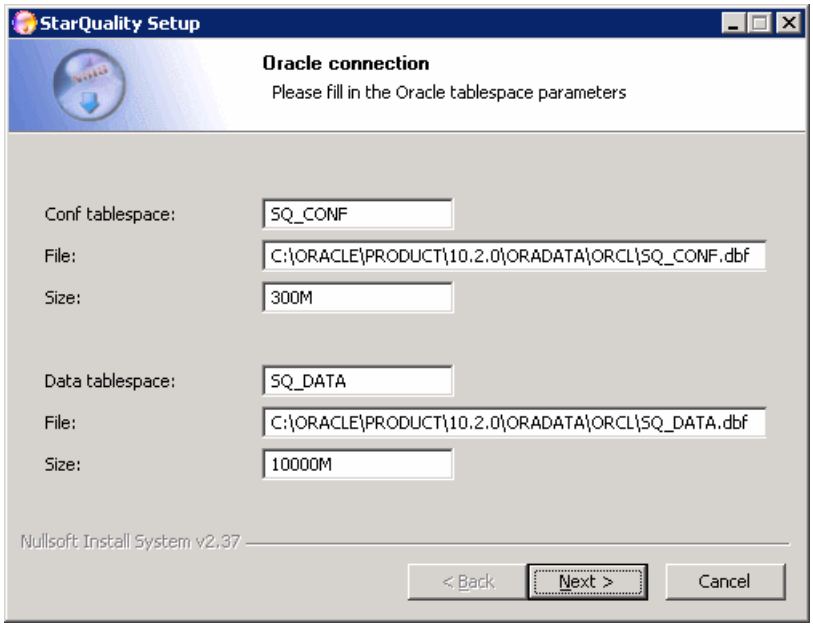


Figure 2-20: Oracle Connection - Tablespace Parameters

13 Click **Next**; The Oracle user parameters are displayed.

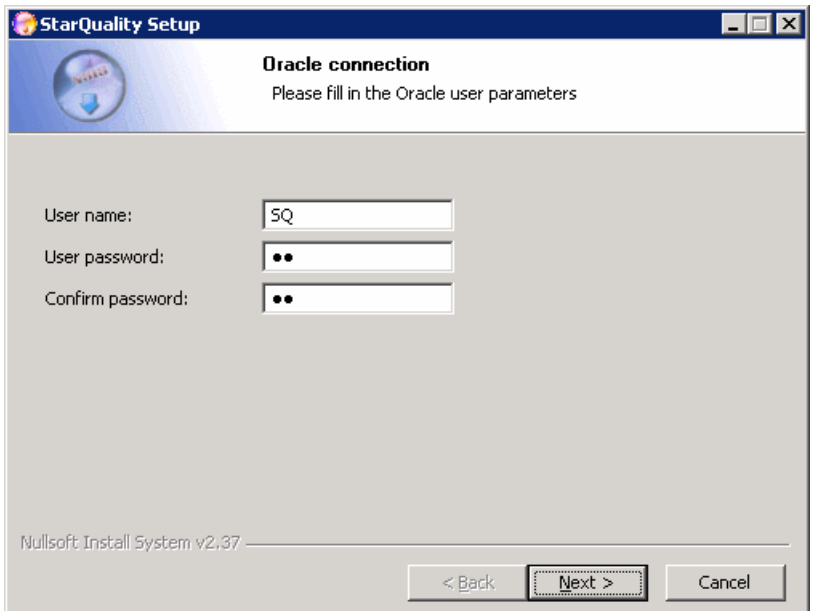


Figure 2-21: Oracle Connection - User Parameters

14 Click **Next**; The installer displays the Setup wizard and completes the installation.

Figure 2-22: StarQuality Setup Wizard - Completing Installation

15 Click **Finish** to close the wizard.

16 To load a licence and run StarQuality, refer to:

- "Loading a StarQuality Licence" on page 93
- "Running StarQuality on Windows" on page 90.

2.3 Installing StarQuality on Windows Server with External Oracle Database on the Same Machine

Before beginning the StarQuality installation refer to Table 2-1 to ensure that this is the correct installation for your system. Check that you have performed all the tasks outlined in Section 2.3.1 below.

This installation type involves the installation of the following components:

- Oracle server (Oracle client is not required)
- cygwin
- StarQuality

2.3.1 Pre-installation Tasks

2.3.1.1 Disk Partitioning

For medium network configurations, containing no more than 350 BTSs or 50,000 CPEs, disk partitioning is recommended, as described in the following table:

Table 2-4: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1	OS, StarQuality SW, Oracle SW
Physical disk 2	Volume 2 - RAID 0	Oracle tablespaces, redo logs, etc. (entire SID)
Physical disk 3		
Physical disk 4		

2.3.1.2 Configuring Network Ports

The following ports must be open between the server machine, client machine, managed network equipment and other NMS/OSS elements:

Table 2-5: Network Ports

Use	Port	Protocol	Direction
App. server and managed equipment	161	SNMP	Outbound towards NE
App. server, managed equipment and other NMS/OSS elements	162	SNMP	Outbound towards NMS/OSS elements
App. server and managed equipment	69	TFTP	From Managed equipment to StarQuality
App. server and client	8080		Inbound/Outbound between client and server
Oracle communication client - server	As installed (Default: 1521)		From StarQuality to Oracle and from Oracle to StarQuality
Sending requests to AlvariSTAR in order to reach KPI	16162	SNMP	

2.3.1.3 Installing Oracle Server

Follow these guidelines:

- Consult Table 2-1 for the correct Oracle Server version.
- Install Oracle Server according to instructions issued by Oracle corporation.
- Make sure that the database is set to a minimum of 170 processes.
- During StarQuality installation, the Oracle server must be running, and the database connection from the StarQuality should be available.
- To test connectivity to the database server from the StarQuality machine, use the *sqlplus* utility as follows:
  - » Assuming that the database SID is `testme`, and system password is `oracle`, switch to the command prompt (on Windows) or use a console (on Solaris, logged in as the Oracle user) and enter the following command: `sqlplus system/oracle@testme`. If the SQL prompt is displayed, connectivity to the database server is confirmed. Any error message should be reported to and resolved by the DBA.
  - » Enter `exit` or `quit` to complete the procedure.

- The following Oracle database information should be available when installing StarQuality:
  - Service name (SID)
  - TNS
  - Password for SYSTEM user

2.3.1.4 Installing Cygwin

Cygwin is a UNIX-like environment for Windows. StarQuality operation commands must always be executed from a cygwin window.

The Cygwin Installation files can be downloaded from the internet (see "To download and install Cygwin from the Internet:" on page 20), or Alvarion FTP Server (see below).

To download and install Cygwin from the Alvarion FTP server:

1. Download the *CygwinFromWwwGoh4Com.zip* file from ftp://downloads.alvarion.com/StarSuite/Star Quality/Installations/ (Username and password required when connecting as *alvarioncustomer*)
2. Extract the zip file into a folder with a path that does not include spaces.
3. From the extracted files run the *setup.exe* file; The Cygwin Net Release Setup Program window is displayed.

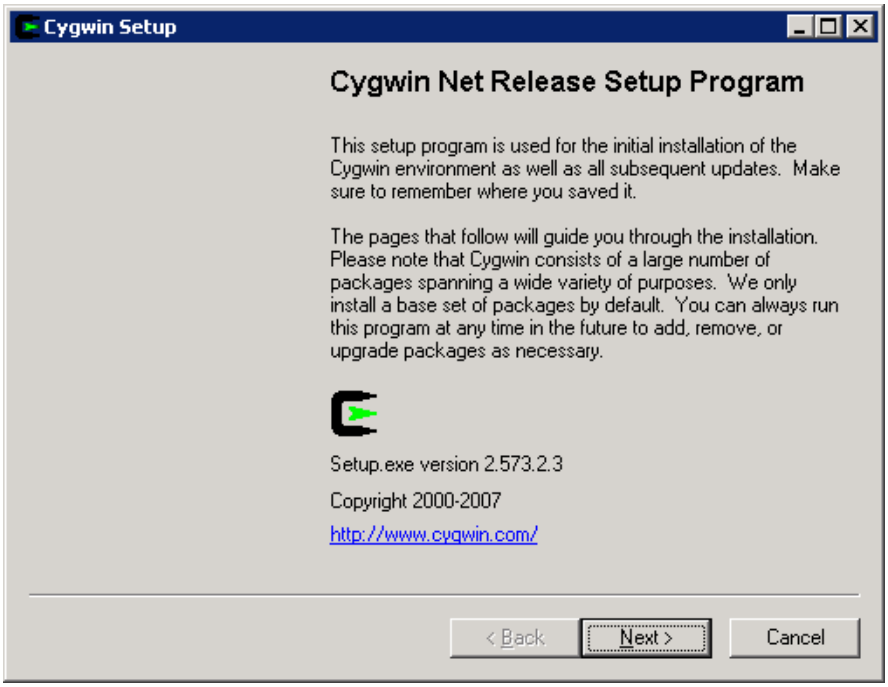

Cygwin Setup
Cygwin Net Release Setup Program
This setup program is used for the initial installation of the Cygwin environment as well as all subsequent updates. Make sure to remember where you saved it.
The pages that follow will guide you through the installation. Please note that Cygwin consists of a large number of packages spanning a wide variety of purposes. We only install a base set of packages by default. You can always run this program at any time in the future to add, remove, or upgrade packages as necessary.
Setup.exe version 2.573.2.3
Copyright 2000-2007
http://www.cygwin.com/
< Back
Next >
Cancel

Figure 2-23: Cygwin Net Release Setup Program window

4 Click **Next**. The Choose a Download Source window is displayed.

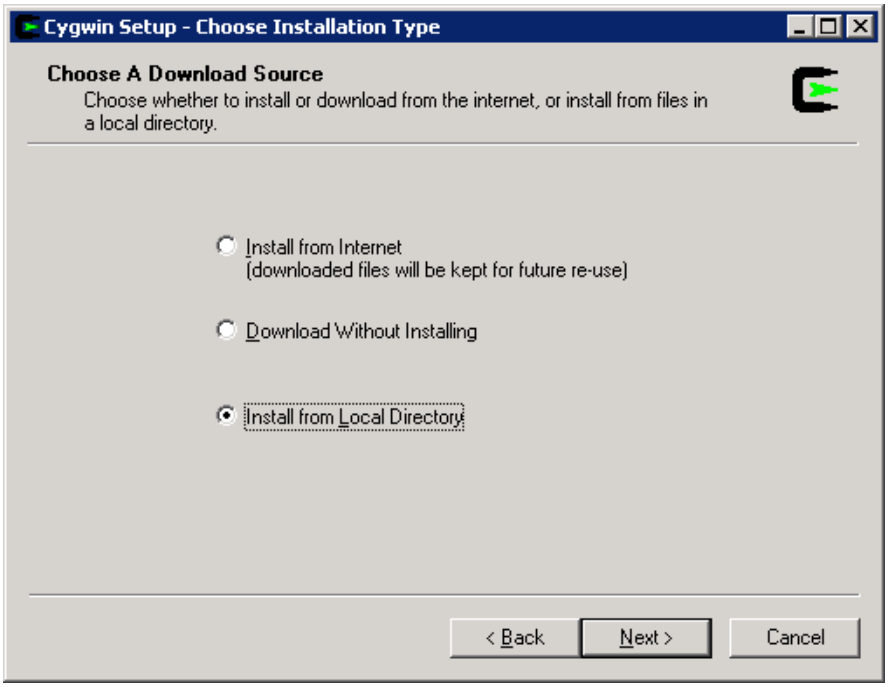

Cygwin Setup - Choose Installation Type
Choose A Download Source
Choose whether to install or download from the internet, or install from files in a local directory.
Install from Internet
(downloaded files will be kept for future re-use)
Download Without Installing
Install from Local Directory
< Back
Next >
Cancel

Figure 2-24: Choose a Download Source Window

5 Select Install from Local directory. Click **Next**.

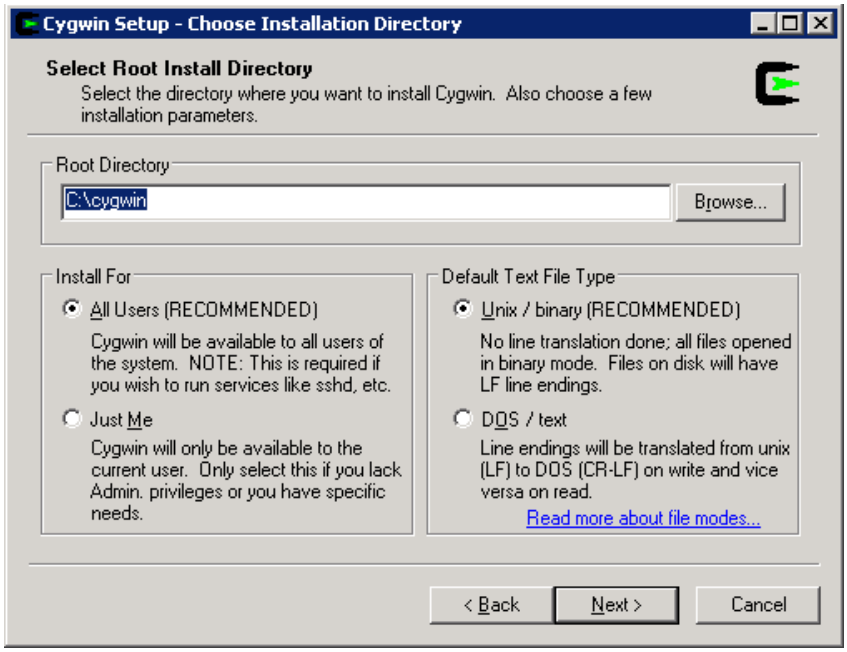

Cygwin Setup - Choose Installation Directory
Select Root Install Directory
Select the directory where you want to install Cygwin. Also choose a few installation parameters.
Root Directory
C:\cygwin
Browse...
Install For
All Users (RECOMMENDED)
Cygwin will be available to all users of the system. NOTE: This is required if you wish to run services like sshd, etc.
Just Me
Cygwin will only be available to the current user. Only select this if you lack Admin. privileges or you have specific needs.
Default Text File Type
Unix / binary (RECOMMENDED)
No line translation done; all files opened in binary mode. Files on disk will have LF line endings.
DOS / text
Line endings will be translated from unix (LF) to DOS (CR-LF) on write and vice versa on read.
Read more about file modes...
< Back
Next >
Cancel

Figure 2-25: Select Root Install Directory

6 Choose settings as recommended on screen. Verify that Root directory is a local drive. Click **Next**.

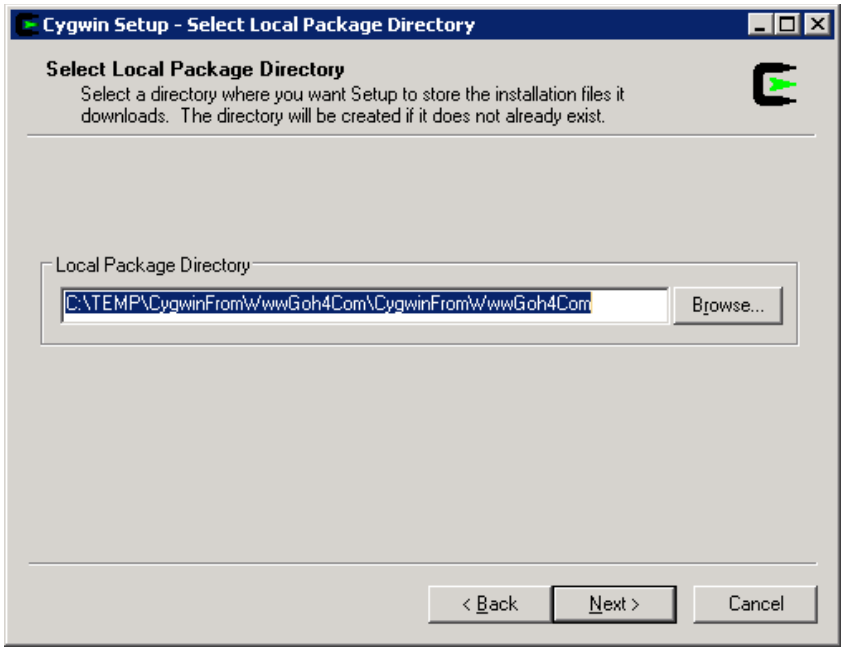

Cygwin Setup - Select Local Package Directory
Select Local Package Directory
Select a directory where you want Setup to store the installation files it downloads. The directory will be created if it does not already exist.
Local Package Directory
C:\TEMP\CygwinFromWwwGoh4Com\CygwinFromWwwGoh4Com
Browse...
< Back
Next >
Cancel

Figure 2-26: Select Local Package Directory

7 Verify that Local Package Directory is the correct path. Click **Next**; The Select Packages window is displayed.

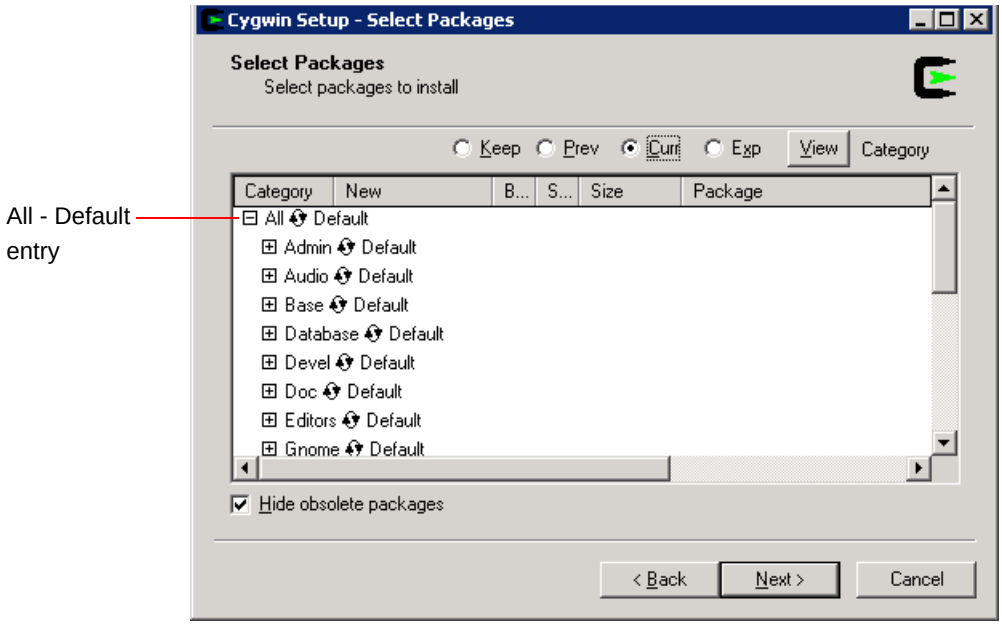


Figure 2-27: Select Packages Window - All Default (Initial State)

8 Click on the word "Default" in the main "All" entry (package) (see Figure 2-6) to change it to "Install".

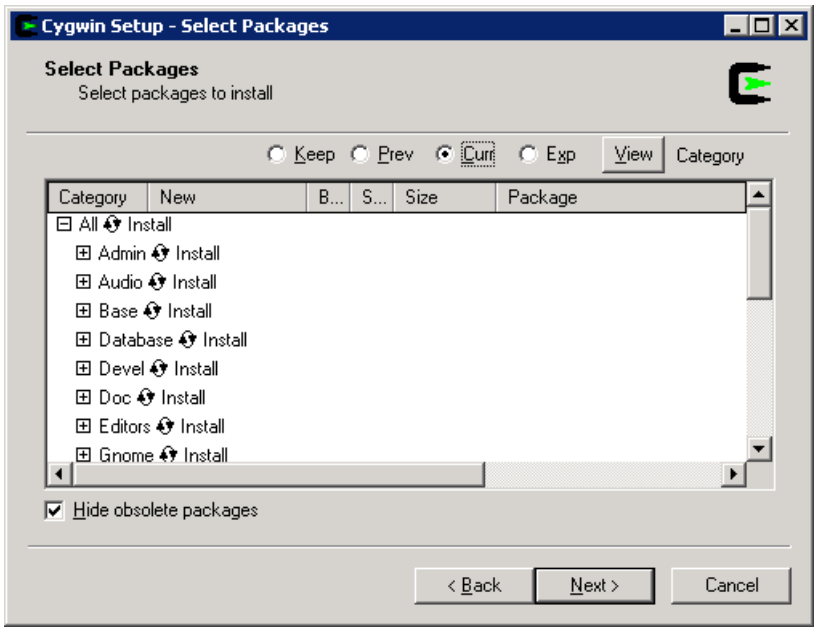


Figure 2-28: Select Packages Window - All "Install"

9 Verify that all the entries under the “All” main package have also been changed to “Install” (see Figure 2-7).

10 Scroll down to the Perl package and expand it using the + sign.

11 Check the sub-package under Perl. If it is other than 5.8.x.x (e.g. “skip”), click on it to change it to the required 5.8.x.x (see Figure 2-8).

NOTE

The Perl version must be 5.8.x.x, otherwise it does not meet the StarQuality requirements. In this case, use a different cygwin installation package.

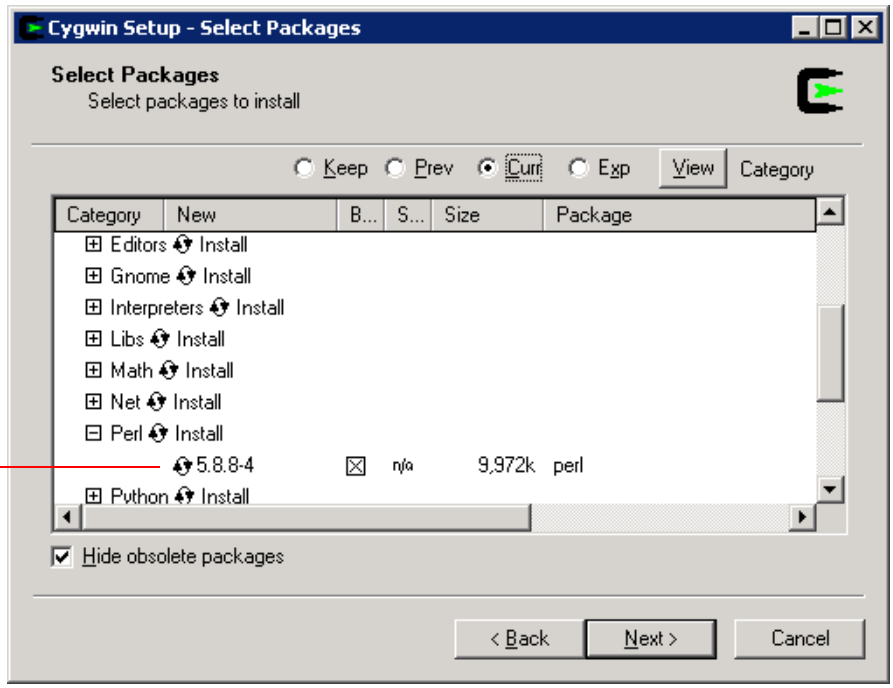


Figure 2-29: Select Packages Window - Perl Version

12 Click **Next**; the installation proceeds until completed.

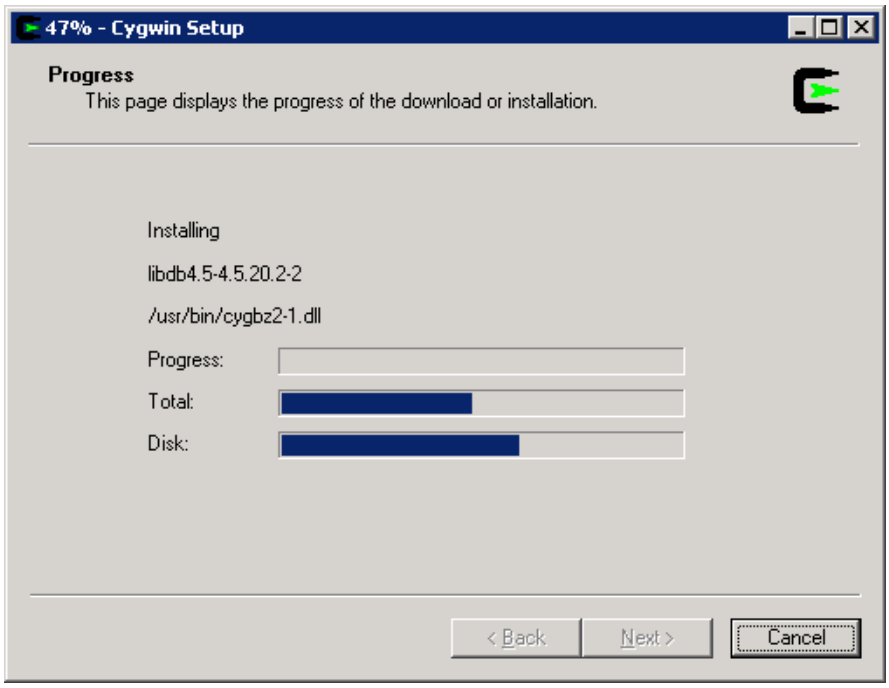


Figure 2-30: Cygwin Installation Process

13 Click **Finish**.

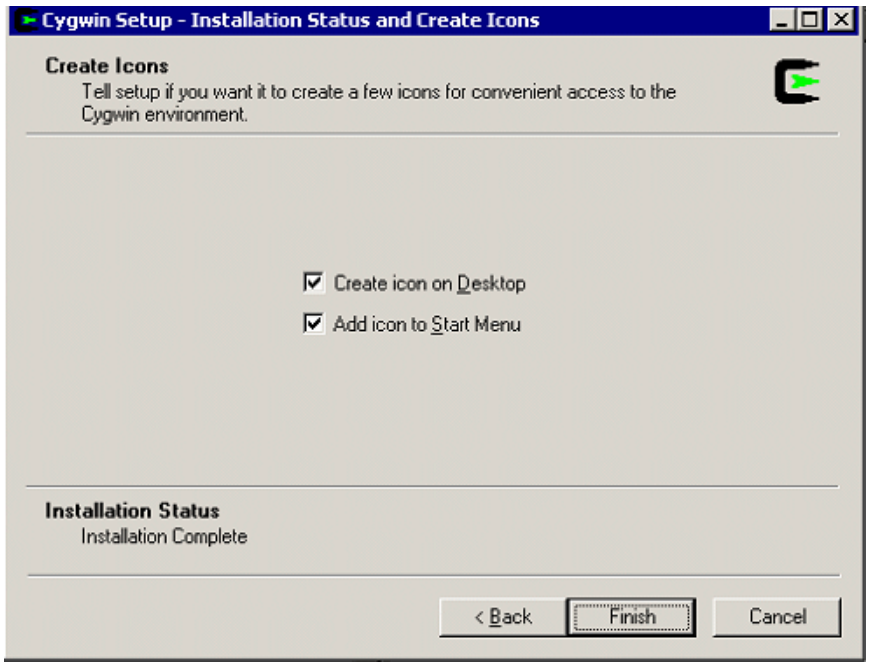

Cygwin Setup - Installation Status and Create Icons
Create Icons
Tell setup if you want it to create a few icons for convenient access to the Cygwin environment.
Create icon on Desktop
Add icon to Start Menu
Installation Status
Installation Complete
< Back
Finish
Cancel

Figure 2-31: Cygwin Installation Completion

To download and install Cygwin from the Internet:

Make sure the Cygwin version you download and use includes the following packages:

Sapache	base-files	base-passwd
bash	binutils	bzip2
coreutils	crypt	cygrunsrv
cygutils	cygwin	editrights
expat	findutils	gawk
gcc-core	gcc-g++	gcc-mingw-core
gcc-mingw-g++	grep	gzip
less	libbz2_1	libdb4.5
libexpat1	libexpat1-devel	libgdbm4
libiconv2	libintl3	libintl8
libncurses8	libpcre0	libpopt0
libreadline6	libwrap0	login
make	mingw-runtime	minires
openssh	openssl	perl - version 5.8.x.x
ping	sed	tar
termcap	terminfo	texinfo
tzcode	vim	w32api
which	zlib	

2.3.2 Installing StarQuality

2.3.2.1 Overview

This Installation type is applicable when installing StarQuality on Windows server with external Oracle database on the same machine (refer to Table 2-1).

The installation has to be performed by a local administrator user.

During the installation the installer writes information into two destinations: the Details view and the log file. To display the Details view, click **Show Details** in the installation wizard. The log file is located in the *Temp* directory of the user (by default *C:\Documents and Settings\<USER>\Local Settings\Temp*).

2.3.2.2 StarQuality Installation Procedure

1 Ensure that the pre-installation task are complete as required in Section 2.3.1

2 Do one of the following:

» Insert the installation DVD into the DVD drive or

» Copy/unzip the Installation folder directly onto one of the disk drives (for example: *C:/*).

IMPORTANT

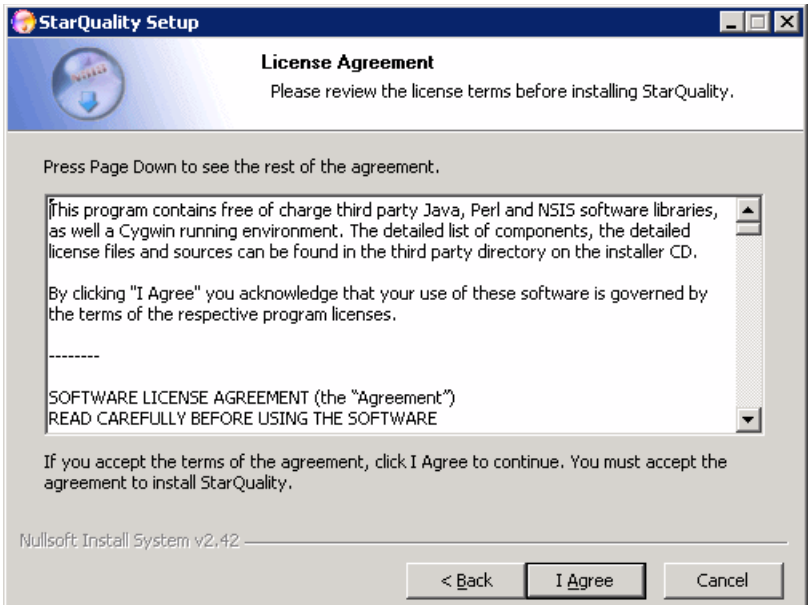
Do not place the installation files into a long path. This is an Oracle installer limitation.

3 Run the installation program *starquality.exe*; The installation wizard is displayed.

StarQuality Setup
Welcome to the StarQuality Setup Wizard
This wizard will guide you through the installation of StarQuality.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel

Figure 2-32: StarQuality Setup Wizard Window

4 Click **Next**; the wizard displays a license agreement. Please read the agreement carefully.


StarQuality Setup
License Agreement
Please review the license terms before installing StarQuality.
Press Page Down to see the rest of the agreement.
This program contains free of charge third party Java, Perl and NSIS software libraries, as well a Cygwin running environment. The detailed list of components, the detailed license files and sources can be found in the third party directory on the installer CD.
By clicking "I Agree" you acknowledge that your use of these software is governed by the terms of the respective program licenses.

SOFTWARE LICENSE AGREEMENT (the "Agreement")
READ CAREFULLY BEFORE USING THE SOFTWARE
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install StarQuality.
Nullsoft Install System v2,42
< Back
I Agree
Cancel

Figure 2-33: Licence Agreement

5 Click **Next**; the wizard displays components to install.

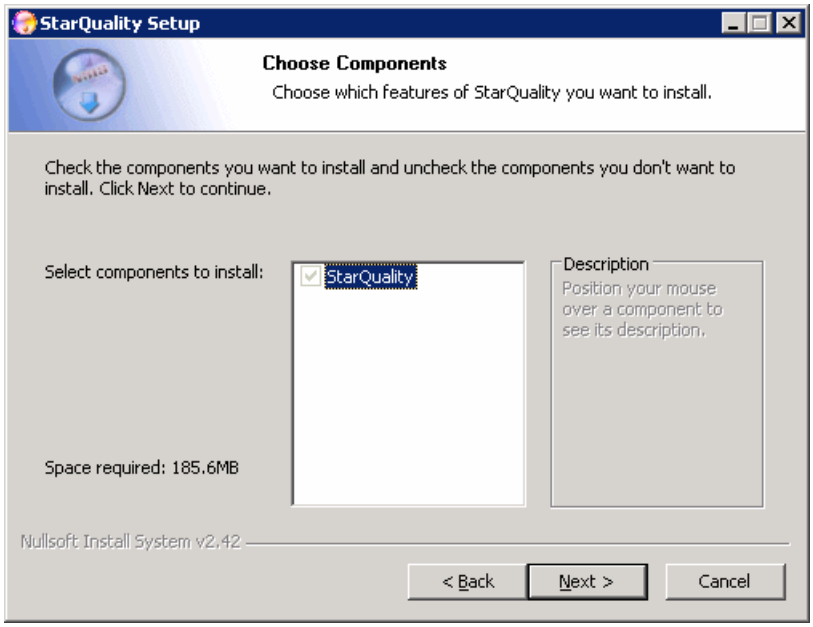

StarQuality Setup
Choose Components
Choose which features of StarQuality you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
Select components to install:
StarQuality
Description
Position your mouse over a component to see its description.
Space required: 185.6MB
Nullsoft Install System v2,42
< Back
Next >
Cancel

Figure 2-34: Choose Components

6 Click **Next**; StarQuality installation starts. To view detailed information click **Show Details**. The content of the details view can be copied to the clipboard.

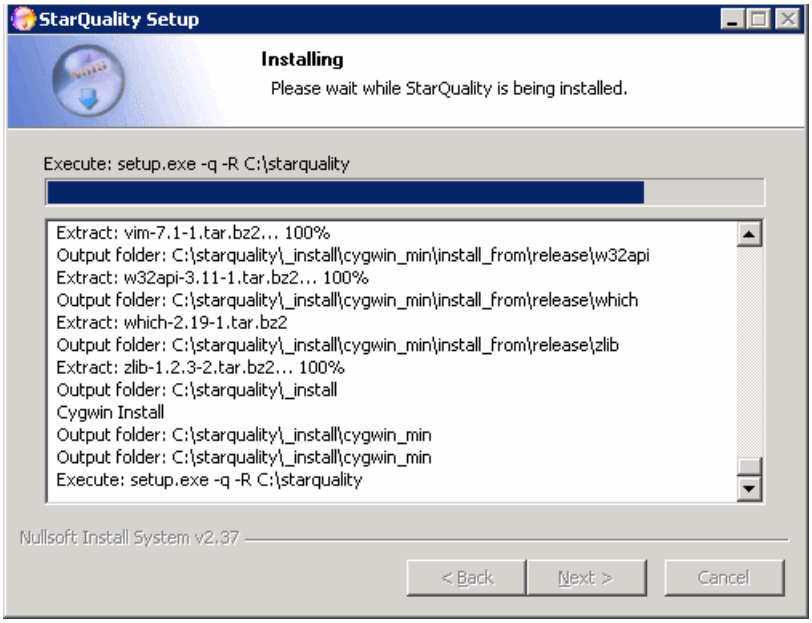


Figure 2-35: StarQuality Installing

The last page indicates that the basic installation is done.

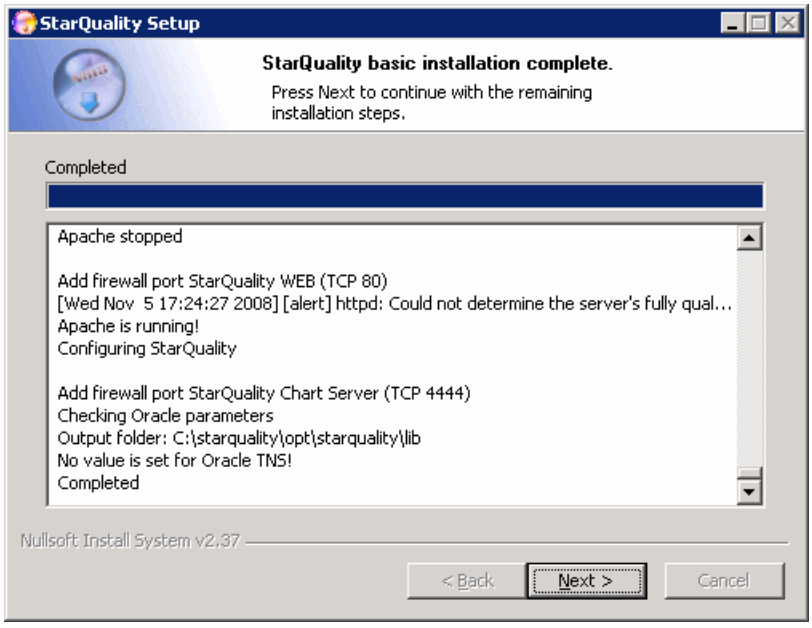

StarQuality Setup
StarQuality basic installation complete.
Press Next to continue with the remaining installation steps.
Completed
Apache stopped
Add firewall port StarQuality WEB (TCP 80)
[Wed Nov 5 17:24:27 2008] [alert] httpd: Could not determine the server's fully qual...
Apache is running!
Configuring StarQuality
Add firewall port StarQuality Chart Server (TCP 4444)
Checking Oracle parameters
Output folder: C:\starquality\opt\starquality\lib
No value is set for Oracle TNS!
Completed
Nullsoft Install System v2.37
< Back
Next >
Cancel

Figure 2-36: StarQuality Basic Installation Complete

7 Click **Next**; The StarQuality Windows Service Registration window is displayed (Figure 2-37). The service will be run with the given Windows user. Fill in and confirm the required password. It is recommended to use the Windows password for the same user.

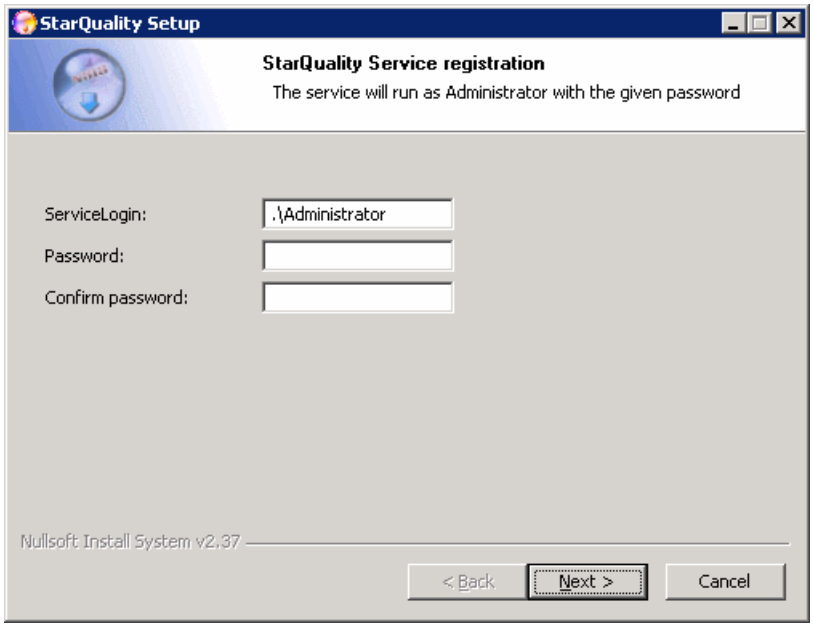


Figure 2-37: StarQuality Windows Service Registration

8 Click **Next**; The Oracle Connection page is displayed (Figure 2-38).

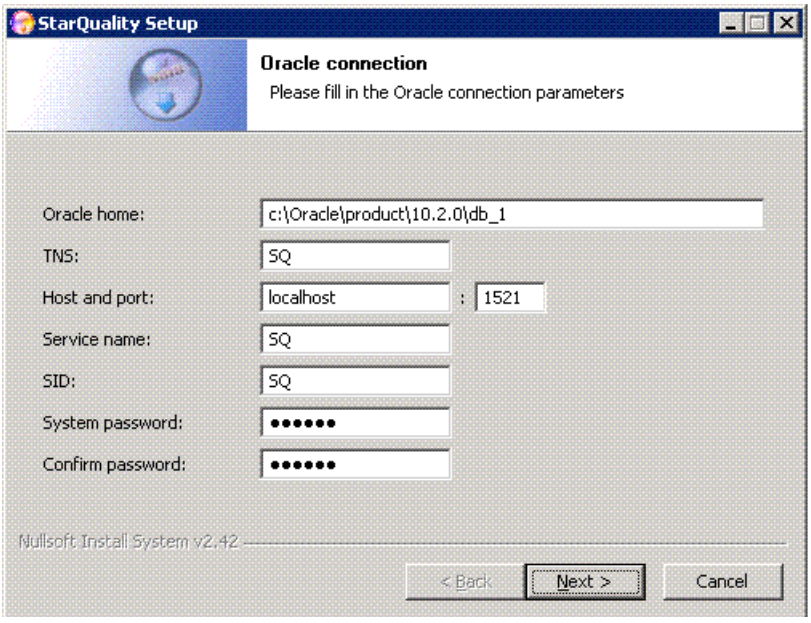


Figure 2-38: Oracle Connection Parameters

9 Verify that the correct values are filled in the following fields:

- **Oracle Home**: Path to the Oracle Home variable.

- **TNS:** the TNS name to be used for the database connection determined during the Oracle database installation. This name appears in the *tnsnames.ora* file on the StarQuality machine.

- **Host and port:** the host of the Oracle database server and port used for connecting to it. Port default is 1521. Host can be either:

  - ”localhost”
  - Host name
  - IP
  - 127.0.0.1

- **Service name and SID:** only one of them needs to be filled in, preferably the Service name.

- **System password and Confirm password:** the password of the SYSTEM user in the database. The password is only used by the installer for the creation of the database user and table spaces, the installer does not save it.

10 Click **Next**; Oracle Connection continues with Oracle tablespace parameters. Point both CONF. and DATA tablespaces to the Oracle data computer partition cording to Table 2-4.

11 Approve the creation of CONF and DATA tablespaces.

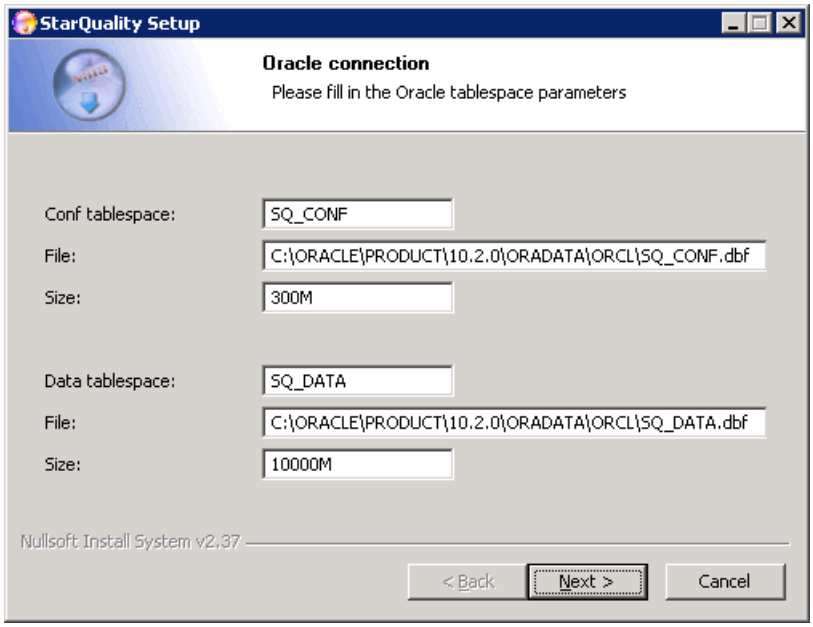


Figure 2-39: Oracle Connection - Tablespace Parameters

12 Click **Next**; Oracle user parameters window is displayed.

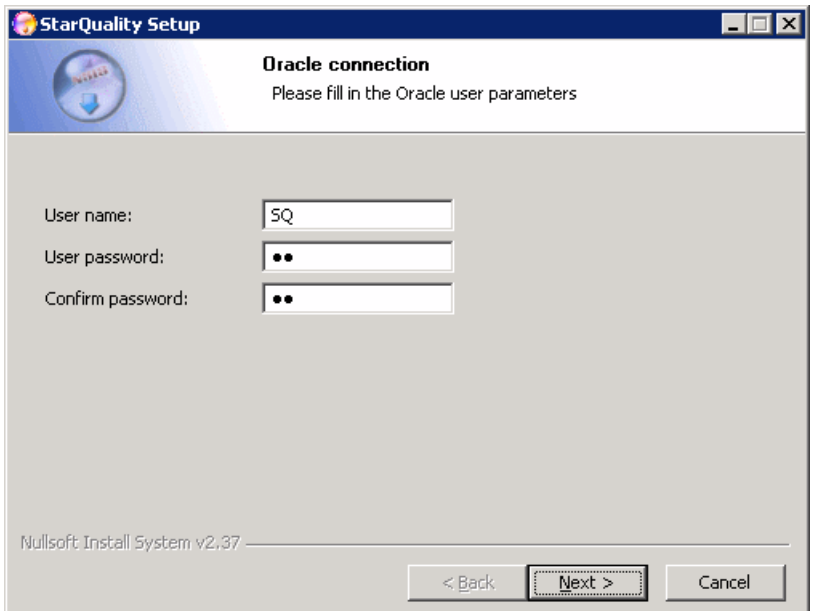


Figure 2-40: Oracle Connection - User Parameters

13 Click **Next**; The installer displays the Setup wizard and completes the installation.

Figure 2-41: StarQuality Setup Wizard - Completing Installation

14 Click **Finish** to close the wizard.

15 To load a licence and run StarQuality, refer to:

- "Loading a StarQuality Licence" on page 93
- "Running StarQuality on Windows" on page 90.

2.4 Installing StarQuality on Windows Server with Oracle Database on a Separate Machine

Before beginning the StarQuality installation refer to Table 2-1 to ensure that this is the correct installation for your system. Check that you have performed all the tasks outlined in Section 2.4.1 below.

This installation type involves the installation of the following components:

- Oracle server on a separate machine
- Oracle client on the StarQuality machine
- cygwin
- StarQuality

2.4.1 Pre-installation Tasks

2.4.1.1 Disk Partitioning

For large network configurations using external Oracle setups, disk partitioning is recommended:

Table 2-6: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1- RAID 0	OS, Star Quality SW, Oracle client SW
Physical disk 2		
Physical disk 3		
Physical disk 4		

2.4.1.2 Configuring Network Ports

The following ports must be open between the server machine, client machine, managed network equipment and other NMS/OSS elements:

Table 2-7: Network Ports

Use	Port	Protocol	Direction
App. server and managed equipment	161	SNMP	Outbound towards NE
App. server, managed equipment and other NMS/OSS elements	162	SNMP	Outbound towards NMS/OSS elements
App. server and managed equipment	69	TFTP	From Managed equipment to StarQuality
App. server and client	8080		Inbound/Outbound between client and server
Oracle communication client - server	As installed (Default: 1521)		From StarQuality to Oracle and from Oracle to StarQuality
Sending requests to AlvariSTAR in order to reach KPI	16162	SNMP	

2.4.1.3 Installing Oracle

Follow these guidelines:

- Consult Table 2-1 for the correct Oracle Server/Client versions.
- Install Oracle Server on a standalone Oracle machine according to instructions issued by Oracle corporation. Make sure that the database is set to a minimum of 170 processes.
- Install Oracle client using the Administrator type installation.
- When completing the Oracle client installation, use the Oracle Net Configuration Assistant to create a connection to the Database server, and test it.
- During StarQuality installation, the Oracle server must be running, and the database connection from the StarQuality machine should be available.

- To test connectivity to the database server from the StarQuality machine, use the *sqlplus* utility as follows:
  - Assuming that the database SID is `testme`, and system password is `oracle`, switch to the command prompt (on Windows) or use a console (on Solaris, logged in as the Oracle user) and enter the following command: `sqlplus system/oracle@testme`.
  - Enter `exit` or `quit` to complete the procedure.
- The following Oracle database information should be available when installing the StarQuality:
  - Oracle Database server IP
  - Service name (SID)
  - TNS
  - Password for SYSTEM use

2.4.1.4 Installing Cygwin

Cygwin is a UNIX-like environment for Windows. StarQuality operation commands must always be executed from a cygwin window.

The Cygwin Installation files can be downloaded from the internet (see "To download and install Cygwin from the Internet:" on page 20), or Alvarion FTP Server (see below).

To download and install Cygwin from the Alvarion FTP server:

1. Download the *CygwinFromWwwGoh4Com.zip* file from ftp://downloads.alvarion.com/StarSuite/Star Quality/Installations/ (Username and password required when connecting as *alvarioncustomer*)
2. Extract the zip file into a folder with a path that does not include spaces.
3. From the extracted files run the *setup.exe* file; The Cygwin Net Release Setup Program window is displayed.

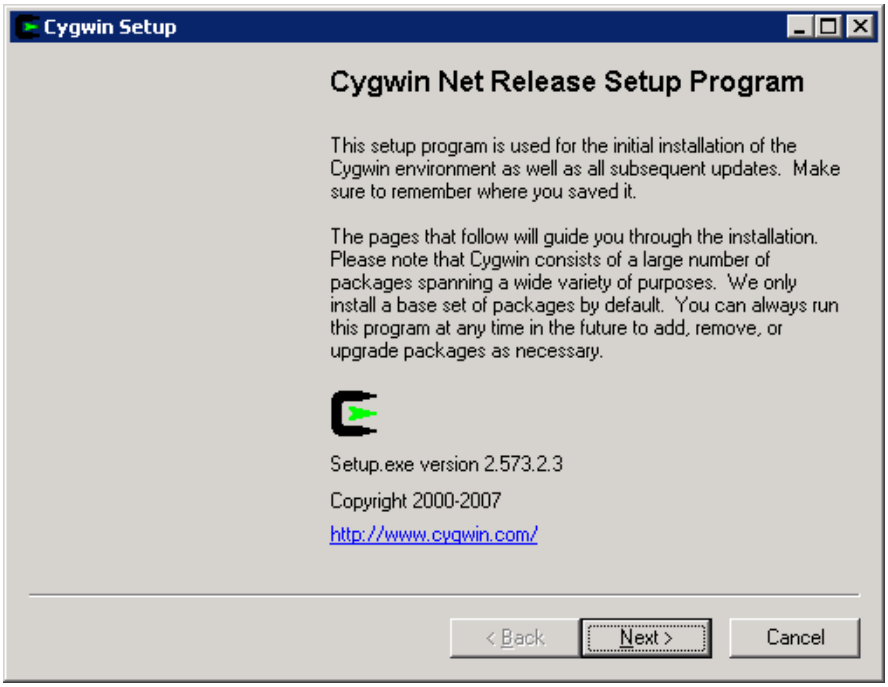

Cygwin Setup
Cygwin Net Release Setup Program
This setup program is used for the initial installation of the Cygwin environment as well as all subsequent updates. Make sure to remember where you saved it.
The pages that follow will guide you through the installation. Please note that Cygwin consists of a large number of packages spanning a wide variety of purposes. We only install a base set of packages by default. You can always run this program at any time in the future to add, remove, or upgrade packages as necessary.
Setup.exe version 2.573.2.3
Copyright 2000-2007
http://www.cygwin.com/
< Back
Next >
Cancel

Figure 2-42: Cygwin Net Release Setup Program window

4 Click **Next**. The Choose a Download Source window is displayed.

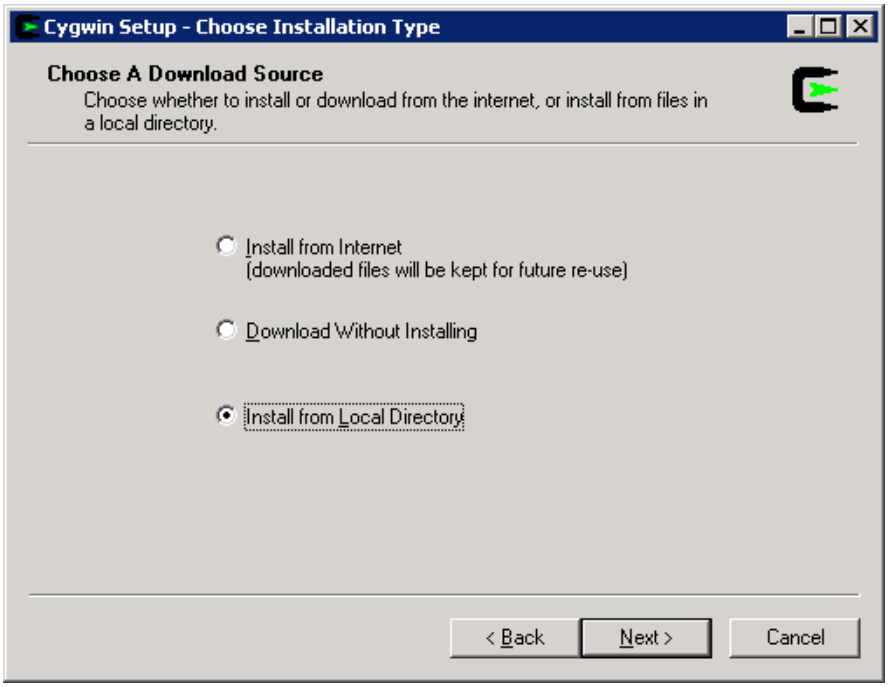

Cygwin Setup - Choose Installation Type
Choose A Download Source
Choose whether to install or download from the internet, or install from files in a local directory.
Install from Internet
(downloaded files will be kept for future re-use)
Download Without Installing
Install from Local Directory
< Back
Next >
Cancel

Figure 2-43: Choose a Download Source Window

5 Select Install from Local directory. Click **Next**.

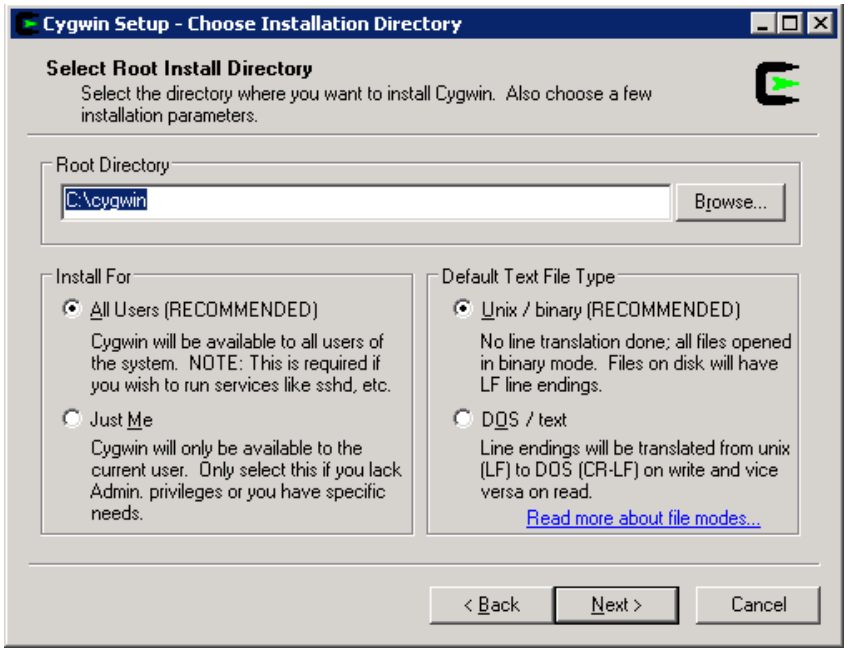

Cygwin Setup - Choose Installation Directory
Select Root Install Directory
Select the directory where you want to install Cygwin. Also choose a few installation parameters.
Root Directory
C:\cygwin
Browse...
Install For
All Users (RECOMMENDED)
Cygwin will be available to all users of the system. NOTE: This is required if you wish to run services like sshd, etc.
Just Me
Cygwin will only be available to the current user. Only select this if you lack Admin. privileges or you have specific needs.
Default Text File Type
Unix / binary (RECOMMENDED)
No line translation done; all files opened in binary mode. Files on disk will have LF line endings.
DOS / text
Line endings will be translated from unix (LF) to DOS (CR-LF) on write and vice versa on read.
Read more about file modes...
< Back
Next >
Cancel

Figure 2-44: Select Root Install Directory

6 Choose settings as recommended on screen. Verify that Root directory is a local drive. Click **Next**.

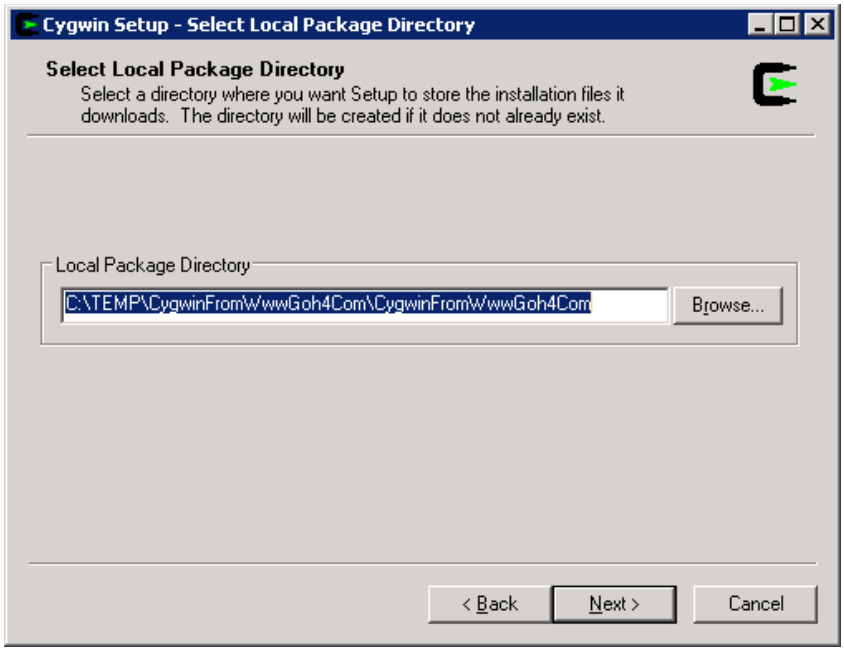

Cygwin Setup - Select Local Package Directory
Select Local Package Directory
Select a directory where you want Setup to store the installation files it downloads. The directory will be created if it does not already exist.
Local Package Directory
C:\TEMP\CygwinFromWwwGoh4Com\CygwinFromWwwGoh4Com
Browse...
< Back
Next >
Cancel

Figure 2-45: Select Local Package Directory

7 Verify that Local Package Directory is the correct path. Click **Next**; The Select Packages window is displayed.

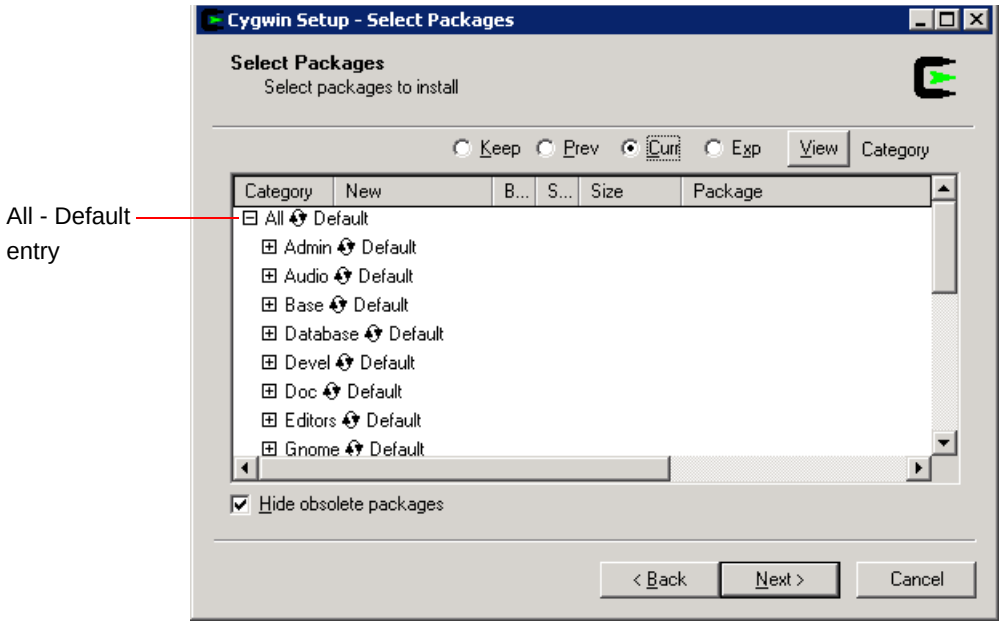


Figure 2-46: Select Packages Window - All Default (Initial State)

8 Click on the word "Default" in the main "All" entry (package) (see Figure 2-6) to change it to "Install".

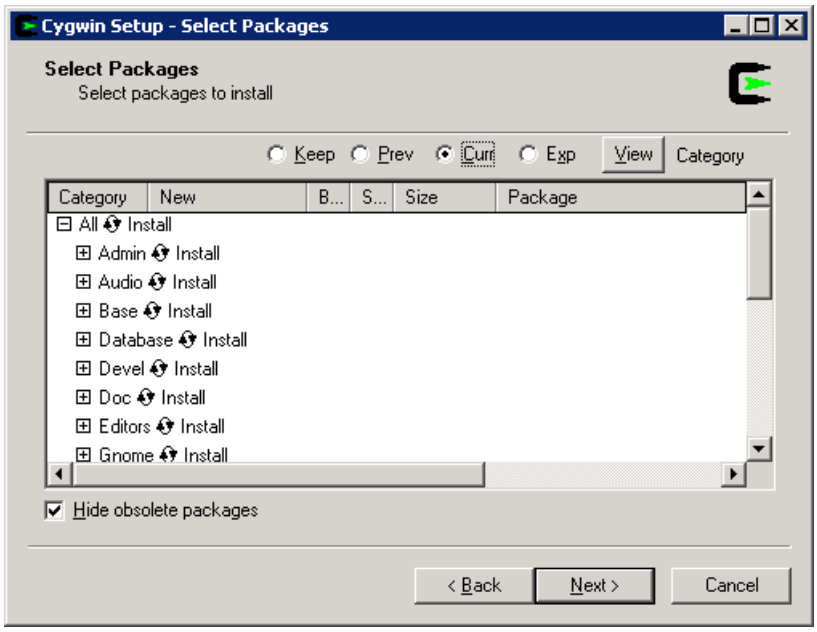


Figure 2-47: Select Packages Window - All "Install"

9 Verify that all the entries under the “All” main package have also been changed to “Install” (see Figure 2-7).

10 Scroll down to the Perl package and expand it using the + sign.

11 Check the sub-package under Perl. If it is other than 5.8.x.x (e.g. “skip”), click on it to change it to the required 5.8.x.x (see Figure 2-8).

NOTE

The Perl version must be 5.8.x.x, otherwise it does not meet the StarQuality requirements. In this case, use a different cygwin installation package.

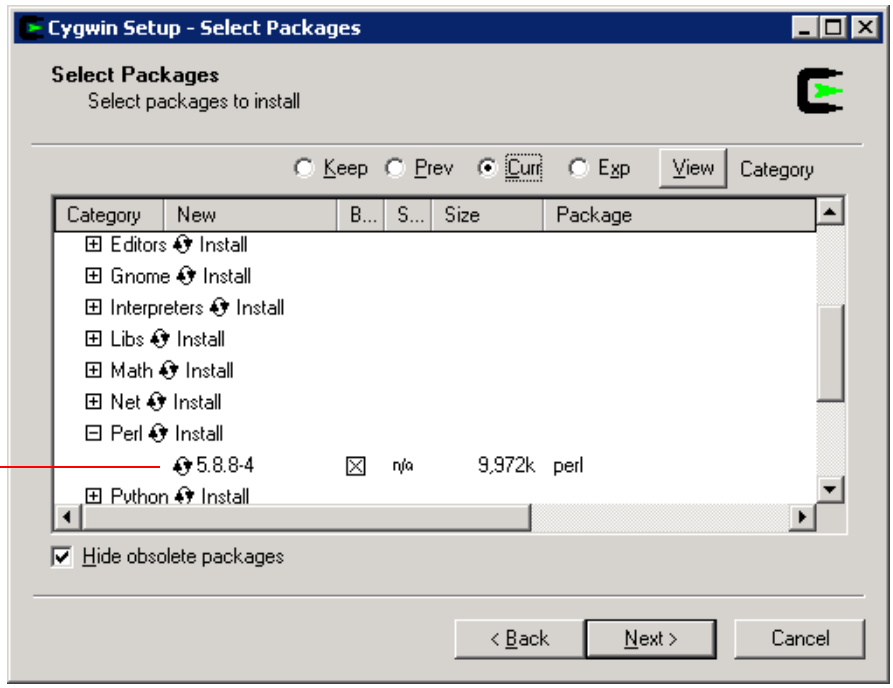


Figure 2-48: Select Packages Window - Perl Version

12 Click **Next**; the installation proceeds until completed.

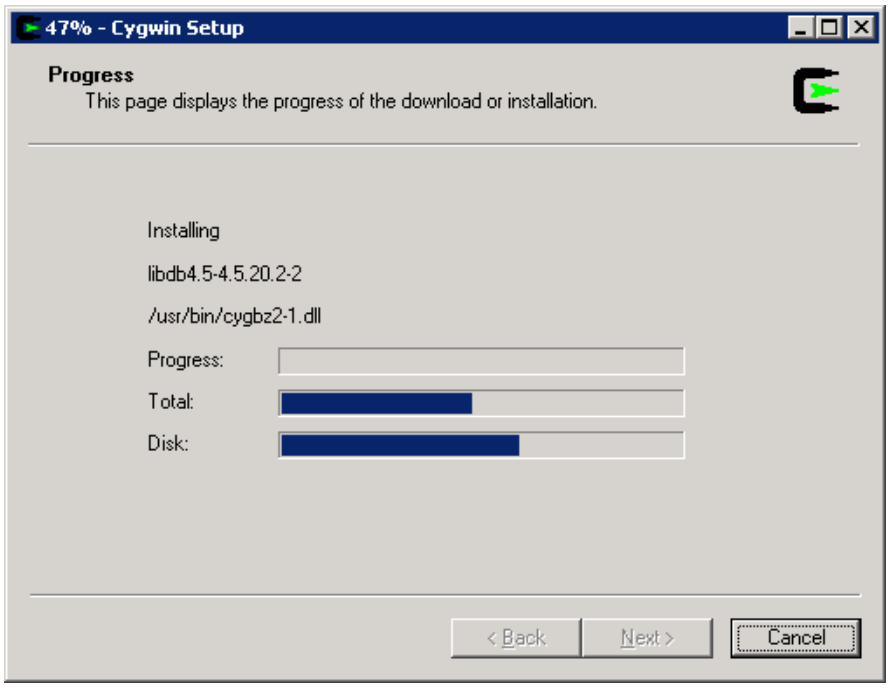


Figure 2-49: Cygwin Installation Process

13 Click **Finish**.

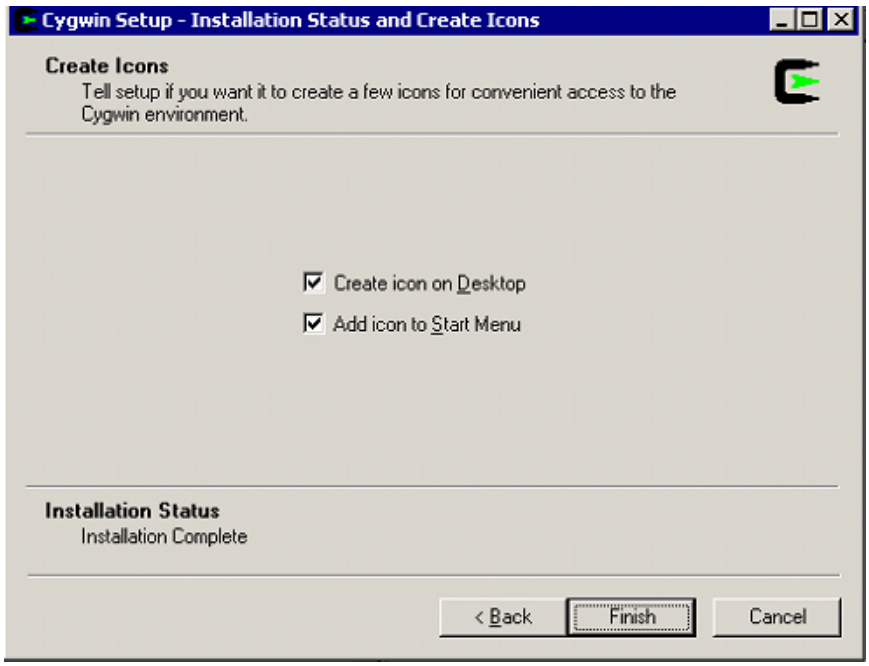

Cygwin Setup - Installation Status and Create Icons
Create Icons
Tell setup if you want it to create a few icons for convenient access to the Cygwin environment.
Create icon on Desktop
Add icon to Start Menu
Installation Status
Installation Complete
< Back
Finish
Cancel

Figure 2-50: Cygwin Installation Completion

To download and install Cygwin from the Internet:

Make sure the Cygwin version you download and use includes the following packages:

Sapache	base-files	base-passwd
bash	binutils	bzip2
coreutils	crypt	cygrunsrv
cygutils	cygwin	editrights
expat	findutils	gawk
gcc-core	gcc-g++	gcc-mingw-core
gcc-mingw-g++	grep	gzip
less	libbz2_1	libdb4.5
libexpat1	libexpat1-devel	libgdbm4
libiconv2	libintl3	libintl8
libncurses8	libpcre0	libpopt0
libreadline6	libwrap0	login
make	mingw-runtime	minires
openssh	openssl	perl - version 5.8.x.x
ping	sed	tar
termcap	terminfo	texinfo
tzcode	vim	w32api
which	zlib	

2.4.2 Installing StarQuality

2.4.2.1 Overview

This Installation type is applicable when installing StarQuality on Windows server with Oracle database on a separate machine (refer to Table 2-1).

The installation has to be performed by a local administrator user.

During the installation the installer writes information into two destinations: the Details view and the log file. To display the Details view, click **Show Details** in the

installation wizard. The log file is located in the *Temp* directory of the user (by default *C:\Documents and Settings\<USER>\Local Settings\Temp*).

2.4.2.2 StarQuality Installation Procedure

1 Do one of the following:

» Insert the installation DVD into the DVD drive or

» Copy/unzip the Installation folder directly onto one of the disk drives (for example: *C:/*).

IMPORTANT

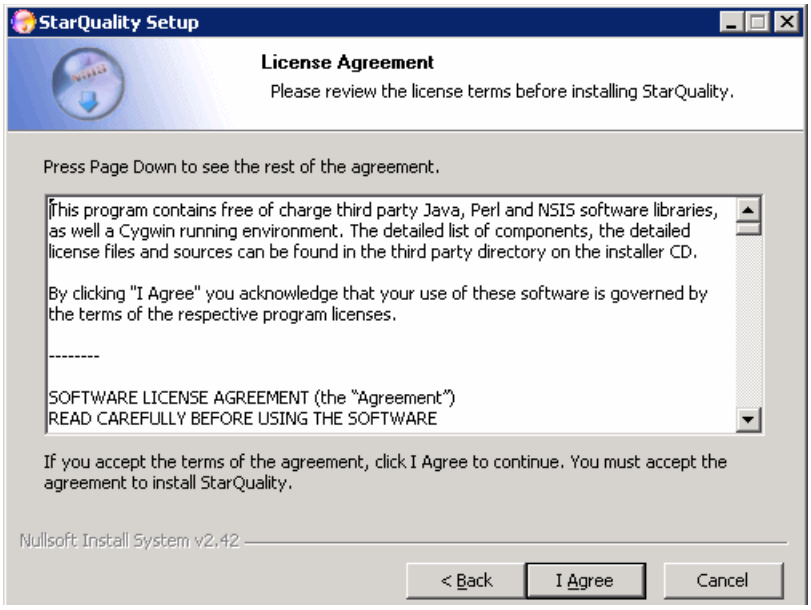
Do not place the installation files into a long path. This is an Oracle installer limitation.

2 Run the installation program *starquality.exe*; The installation wizard is displayed.

StarQuality Setup
Welcome to the StarQuality Setup Wizard
This wizard will guide you through the installation of StarQuality.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel

Figure 2-51: StarQuality Setup Wizard Window

3 Click **Next**; the wizard displays a license agreement. Please read the agreement carefully.


StarQuality Setup
License Agreement
Please review the license terms before installing StarQuality.
Press Page Down to see the rest of the agreement.
This program contains free of charge third party Java, Perl and NSIS software libraries, as well a Cygwin running environment. The detailed list of components, the detailed license files and sources can be found in the third party directory on the installer CD.
By clicking "I Agree" you acknowledge that your use of these software is governed by the terms of the respective program licenses.

SOFTWARE LICENSE AGREEMENT (the "Agreement")
READ CAREFULLY BEFORE USING THE SOFTWARE
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install StarQuality.
Nullsoft Install System v2,42
< Back
I Agree
Cancel

Figure 2-52: Licence Agreement

4 Click **Next**; the wizard displays components to install.

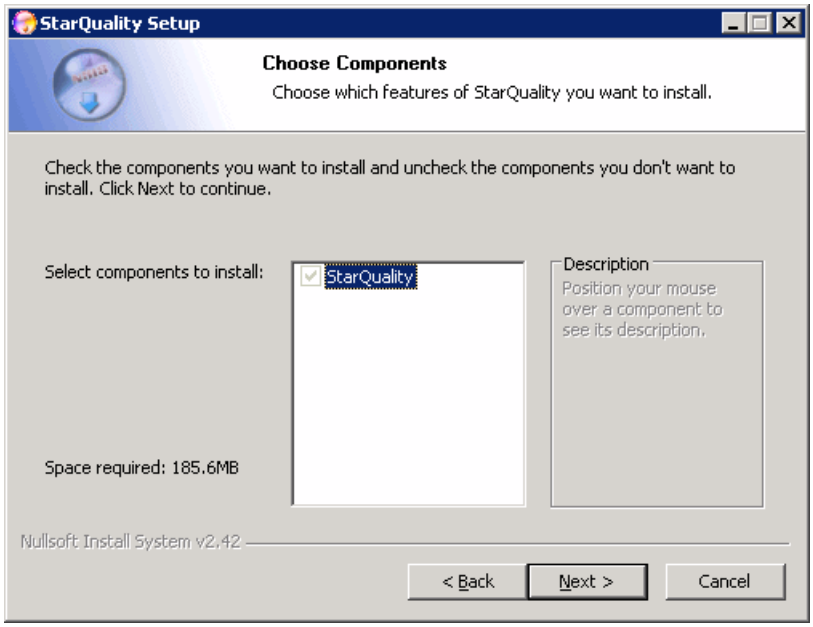

StarQuality Setup
Choose Components
Choose which features of StarQuality you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
Select components to install:
StarQuality
Description
Position your mouse over a component to see its description.
Space required: 185.6MB
Nullsoft Install System v2,42
< Back
Next >
Cancel

Figure 2-53: Choose Components

5 Click **Next**; StarQuality installation starts. To view detailed information click **Show Details**. The content of the details view can be copied to the clipboard.

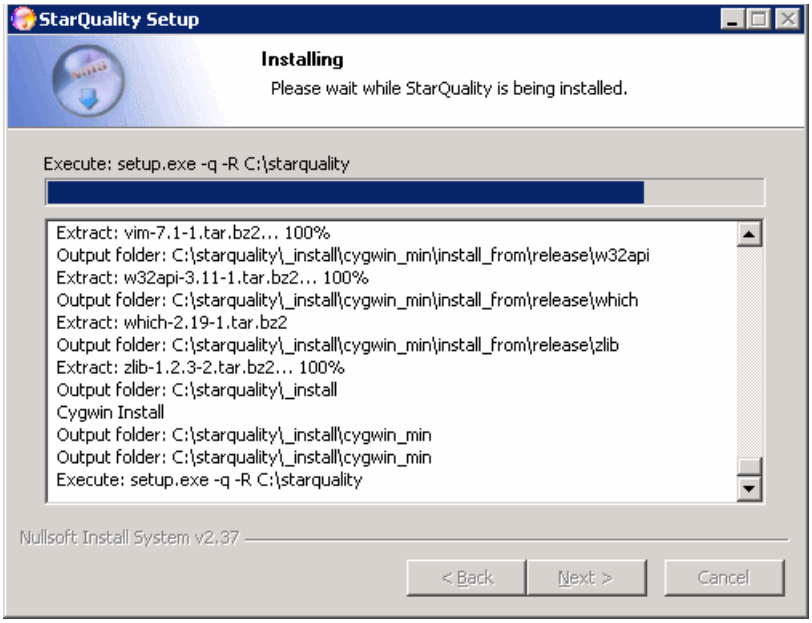


Figure 2-54: StarQuality Installing

The last page indicates that the basic installation is done.

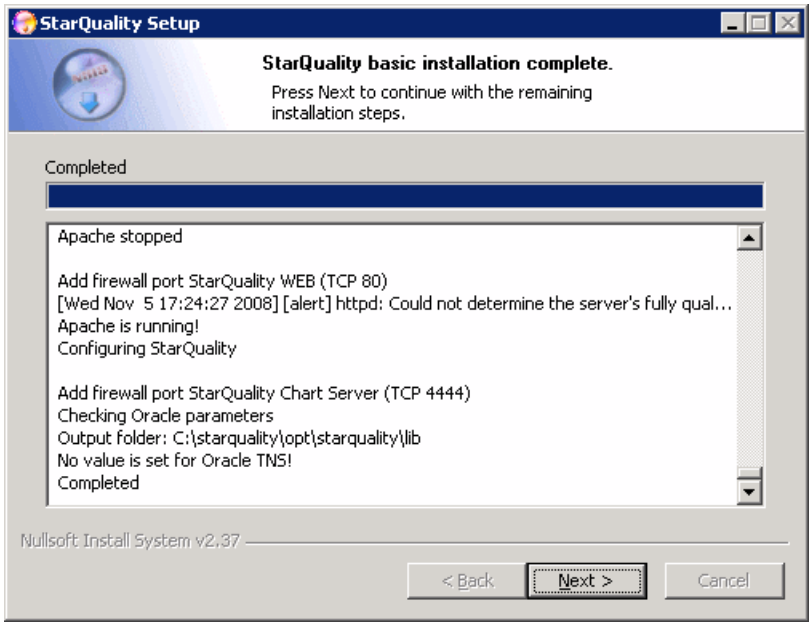

StarQuality Setup
StarQuality basic installation complete.
Press Next to continue with the remaining installation steps.
Completed
Apache stopped
Add firewall port StarQuality WEB (TCP 80)
[Wed Nov 5 17:24:27 2008] [alert] httpd: Could not determine the server's fully qual...
Apache is running!
Configuring StarQuality
Add firewall port StarQuality Chart Server (TCP 4444)
Checking Oracle parameters
Output folder: C:\starquality\opt\starquality\lib
No value is set for Oracle TNS!
Completed
Nullsoft Install System v2.37
< Back
Next >
Cancel

Figure 2-55: StarQuality Basic Installation Complete

6 Click **Next**; The StarQuality Service Registration window is displayed. Fill in and confirm the required password. It is recommended to use the Windows password for the same user.

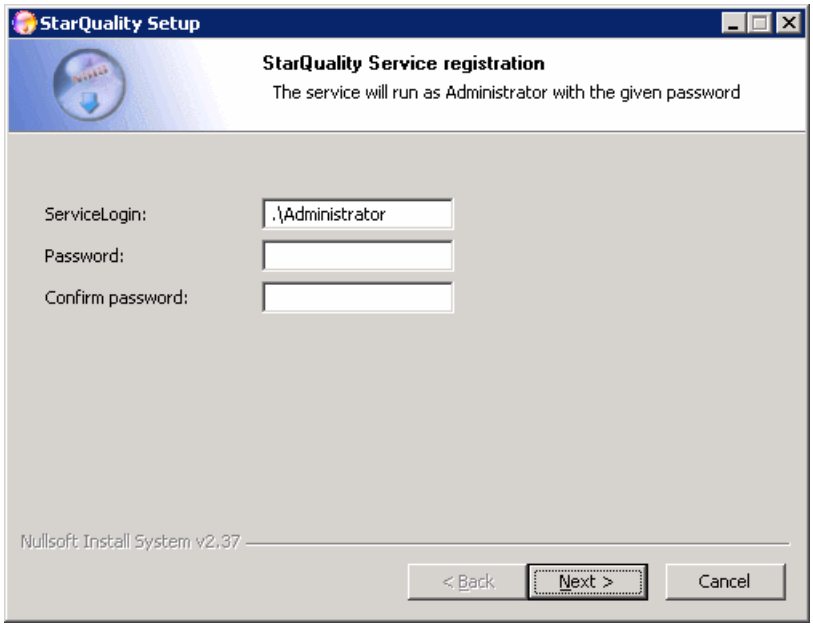


Figure 2-56: StarQuality Windows Service Registration

7 Click **Next**; The Oracle Connection page is displayed (Figure 2-19).

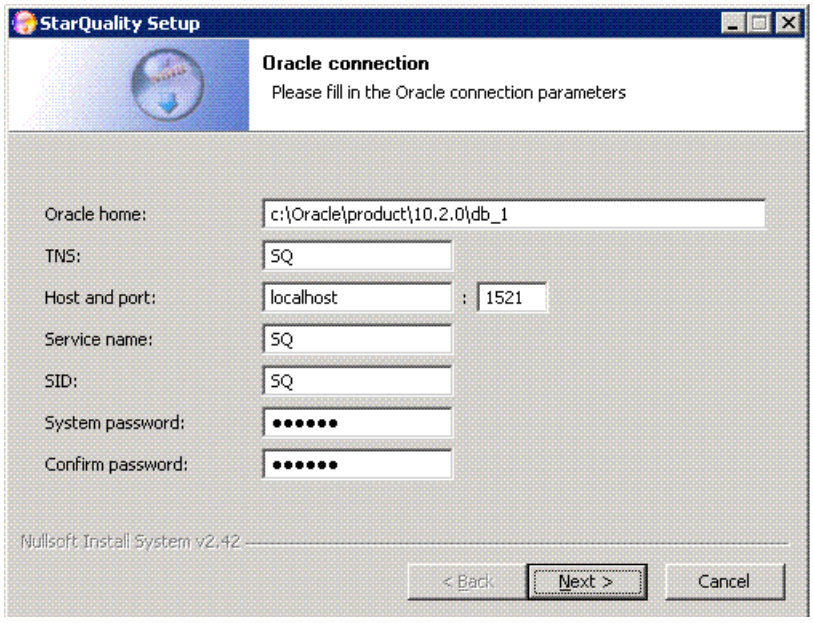


Figure 2-57: Oracle Connection Parameters

8 Verify that the correct values are filled in the following fields:

- **Oracle Home**: Path to the Oracle Client Home variable on the StarQuality machine.

- **TNS:** the TNS name to be used for the database connection as appears in the *tnsnames.ora* file on the StarQuality machine.

- **Host and port:** IP of the Oracle database server and port used for connecting to it. Port default is 1521

- **Service name and SID:** only one of them needs to be filled in, preferably the Service name.

- **System password and Confirm password:** the password of the SYSTEM user in the database. The password is only used by the installer for the creation of the database user and table spaces, the installer does not store it.

9 Click **Next**; Oracle Connection continues with Oracle tablespace parameters.

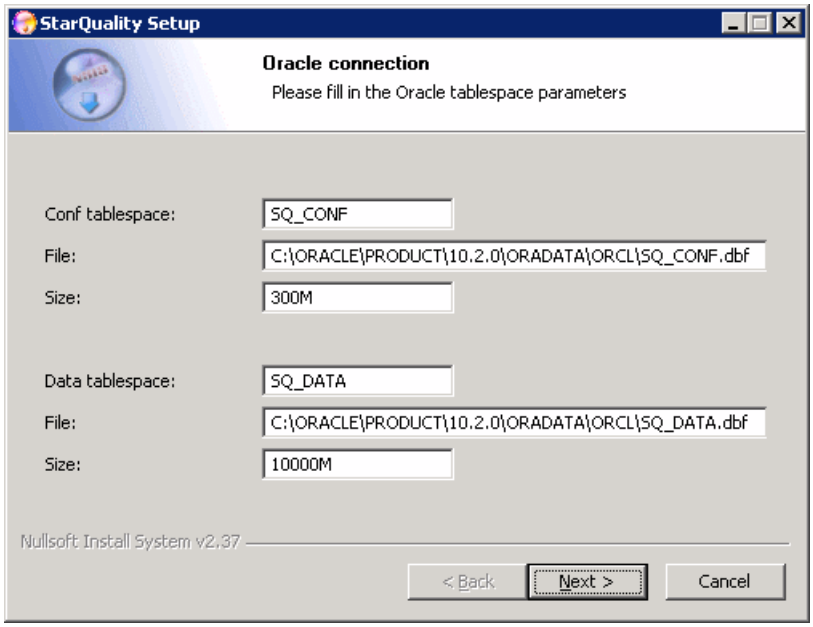


Figure 2-58: Oracle Connection - Tablespace Parameters

10 Click **Next**; The user parameters are displayed.

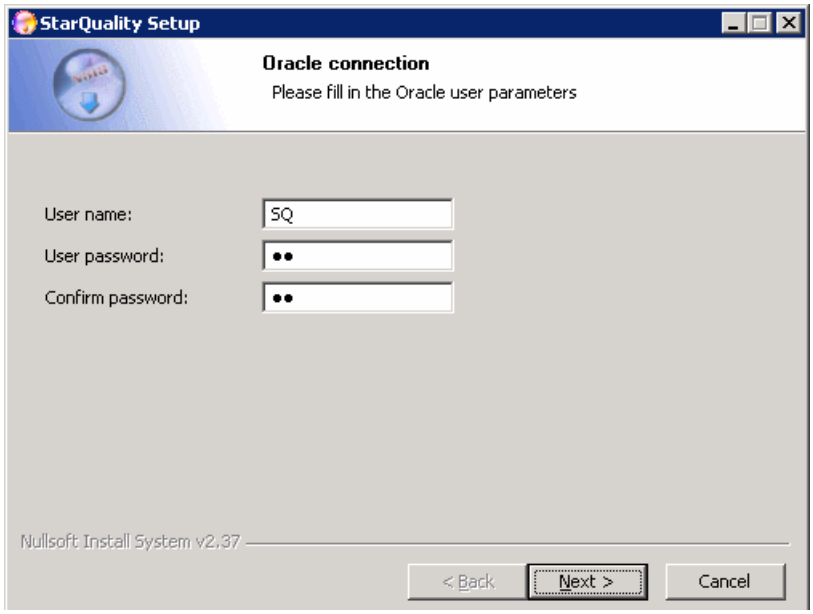


Figure 2-59: Oracle Connection - User Parameters

11 Click **Next**; The installer displays the Setup wizard and completes the installation.

Figure 2-60: StarQuality Setup Wizard - Completing Installation

12 Click **Finish** to close the wizard.

13 To load a licence and run StarQuality, refer to:

- “Loading a StarQuality Licence” on page 93
- “Running StarQuality on Windows” on page 90.

2.5 Installing StarQuality on Solaris Server with Internal Oracle Database

Before beginning the StarQuality installation refer to Table 2-1 to ensure that this is the correct installation for your system. Check that you have performed all the tasks outlined in Section 2.5.1 below.

This installation type involves configuration of the Solaris kernel parameters and then installation of StarQuality.

2.5.1 Pre-installation Tasks

2.5.1.1 Disk Partitioning

For medium network configurations, containing no more than 350 BTSs or 50,000 CPEs, disk partitioning is recommended, as described in the following table:

Table 2-8: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1	OS, StarQuality SW, Oracle SW
Physical disk 2	Volume 2 - RAID 0	Oracle tablespaces, redo logs, etc. (entire SID)
Physical disk 3		
Physical disk 4		

For large network configurations, containing no more than 1000 BTSs or 250,000 CPEs, disk partitioning is recommended, as described in the following table (Note that the HDDs have a capacity of 500 GB):

Table 2-9: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1	OS, StarQuality SW, Oracle SW
Physical disk 2	Volume 2 - RAID 0	Oracle tablespaces, redo logs, etc. (entire SID)
Physical disk 3		
Physical disk 4		
Physical disk 5		
Physical disk 6		
Physical disk 7		
Physical disk 8		
Physical disk 9		
Physical disk 10		

2.5.1.2 Configuring Kernel Parameters for Solaris x86

1 Add the following entries to the */etc/system* file and reboot the system:

```
set shmsys:shminfo_shmmax=4294967295
set shmsys:shminfo_shmmni=100
set semsys:seminfo_semmni=100
set semsys:seminfo_semmsl=256
```

2 Verify a minimum of 10 GB swap space

2.5.1.3 Configuring Network Ports

The following ports must be open between the server machine, client machine, managed network equipment and other NMS/OSS elements:

Table 2-10: Network Ports

Use	Port	Protocol	Direction
App. server and managed equipment	161	SNMP	Outbound towards NE
App. server, managed equipment and other NMS/OSS elements	162	SNMP	Outbound towards NMS/OSS elements
App. server and managed equipment	69	TFTP	From Managed equipment to StarQuality
App. server and client	8080		Inbound/Outbound between client and server
Sending requests to AlvariSTAR in order to reach KPI	16162	SNMP	

2.5.2 Installing StarQuality

StarQuality can be installed on a Solaris 10 x86 operating system using the command-line installer.

For additional information on the installer commands and parameters, refer to "Command Line Installer General Information" on page 96

All operations should be done while logged in as *root* user.

To install StarQuality:

1. Run the installer application, *StarQuality.v3.0.en.bin*, either directly from the installation DVD or from a directory to which the file was transferred (using FTP).
2. The following sections describe the installation process and details.

2.5.2.1 Basic Checks

The installer checks the following details:

- Version of the operating system
- Required packages

- Version of Perl and the options used to build the Perl binary,

If the application detects an error during these checks, then depending on the level of error, it either immediately terminates or asks whether it should continue or not. Always answer No and restart the installation.

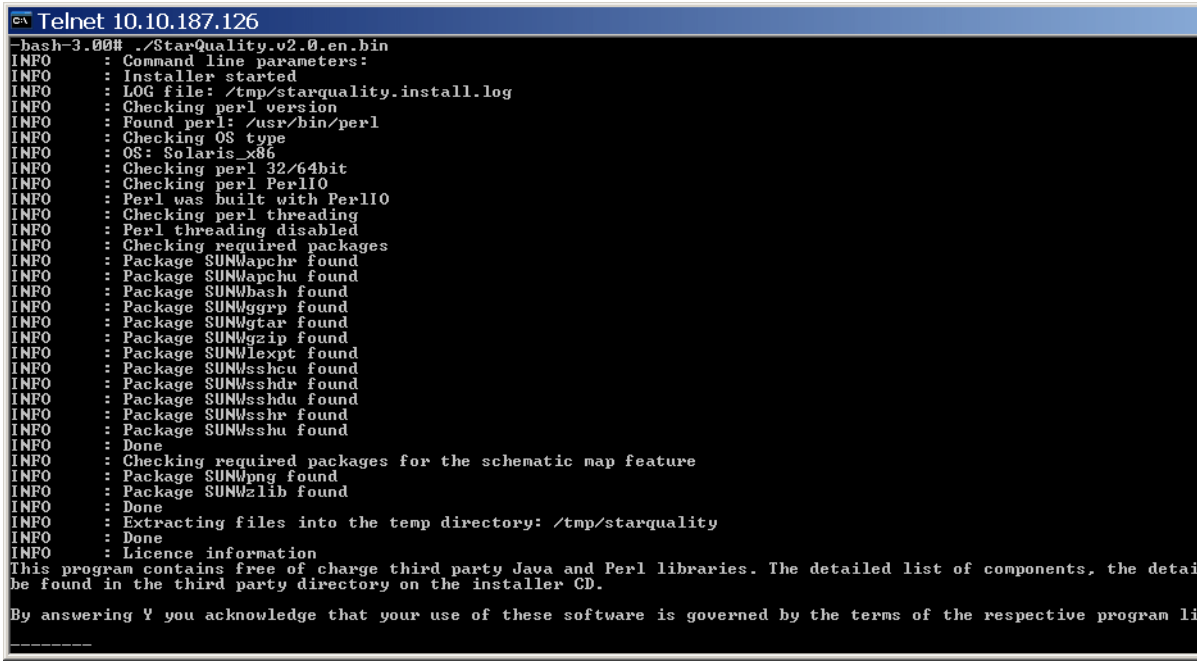

Telnet 10.10.187.126
-bash-3.00# ./StarQuality.v2.0.en.bin
INFO : Command line parameters:
INFO : Installer started
INFO : LOG file: /tmp/starquality.install.log
INFO : Checking perl version
INFO : Found perl: /usr/bin/perl
INFO : Checking OS type
INFO : OS: Solaris_x86
INFO : Checking perl 32/64bit
INFO : Checking perl PerlIO
INFO : Perl was built with PerlIO
INFO : Checking perl threading
INFO : Perl threading disabled
INFO : Checking required packages
INFO : Package SUNWapchr found
INFO : Package SUNWapchu found
INFO : Package SUNWbash found
INFO : Package SUNWggrp found
INFO : Package SUNWgtar found
INFO : Package SUNWgzip found
INFO : Package SUNWlexpt found
INFO : Package SUNWsshcu found
INFO : Package SUNWsshdr found
INFO : Package SUNWsshdu found
INFO : Package SUNWsshr found
INFO : Package SUNWsshu found
INFO : Done
INFO : Checking required packages for the schematic map feature
INFO : Package SUNWpng found
INFO : Package SUNWzlib found
INFO : Done
INFO : Extracting files into the temp directory: /tmp/starquality
INFO : Done
INFO : Licence information
This program contains free of charge third party Java and Perl libraries. The detailed list of components, the detai
be found in the third party directory on the installer CD.
By answering Y you acknowledge that your use of these software is governed by the terms of the respective program li
----

Figure 2-61: Installation on Solaris - Basic Checks

2.5.2.2 License Information

When the basic checks are complete, the license agreement is displayed. To scroll down the agreement, press either the spacebar or the Enter key.

Read the agreement carefully before accepting.

2.5.2.3 Installing Embedded Oracle Database

The application prompts for the operating system user utilized during the Oracle installation. This part can take up to 30 minutes depending on the computer characteristics. After providing it, the application tries to find an Oracle user on the machine. Only if such a user does not exist, will the installer prompt for the installation of internal Oracle.

Select Telnet 10.10.187.117
elief, in addition to all other remedies that may be available, in law, at equit
y or otherwise.
If you have any questions concerning this Agreement, please contact us at: http:
//www.alvarion.com.
ATT: Legal Department
E-mail: legal@alvarion.com
QUESTION : Do you agree to the licence terms (Y/N) []: y
INFO : The perl /usr/bin/perl is the same as the /usr/local/bin/perl
QUESTION : The OS user of Oracle [oracle]:
INFO : Oracle user oracle doesn't exist
QUESTION : Do you want to install Oracle? (Y/N) [N]: y
INFO : Embeded Oracle install supported
QUESTION : Please specify Oracle 10 installer directory!
The directory have to contains both setup and patch:
install_directory/
10201_database_solx86_64/database/runInstaller
p6810189_10204_Solaris86-64/Disk1/runInstaller
[/tmp/sq2.5/Setup/db]: /export/home/downloads/sq2.5/Setup/db
QUESTION : Please specifie Oracle home directory! [/export/home/oracle]:
INFO : ora_config_file: /tmp/starquality/scripts_deploy/oraparam.properties
./StarQuality.v2.5.4.en.bin: line 2639: /tmp/starquality/scripts_deploy/oraparam
.properties=/var/starquality/oraparam.properties: No such file or directory
INFO : Oracle install configuration file: /tmp/starquality/scripts_deploy/or
aparam.properties
INFO : Oracle install step: USER_ADD (start:Wednesday, June 2, 2010 12:32:1
6 PM IDT)
LOGDIR=/tmp/starquality/log/create_group
RC=SUCCESS
LOGDIR=/tmp/starquality/log/oracle_dir
RC=SUCCESS
INFO : Oracle install step: USER_ADD (finished:Wednesday, June 2, 2010 12:3
2:19 PM IDT)
INFO : Oracle install step: SETUP_ADD (start:Wednesday, June 2, 2010 12:32:
19 PM IDT)
Sun Microsystems Inc. SunOS 5.10 Generic January 2005
Starting Oracle Universal Installer...
Checking installer requirements...
Checking operating system version: must be 5.10. Actual 5.10
Passed
Checking Temp space: must be greater than 250 MB. Actual 7741 MB Passed
Checking swap space: must be greater than 500 MB. Actual 8049 MB Passed
All installer requirements met.
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2010-06-02_12
-32-20PM. Please wait ...Oracle Universal Installer, Version 10.2.0.1.0 Producti
on
Copyright (C) 1999, 2005, Oracle. All rights reserved.
You can find a log of this install session at:
/export/home/oracle/oraInventory/logs/installActions2010-06-02_12-32-20PM.log

Figure 2-62: Installing Embedded Oracle Database

2.5.2.4 StarQuality Installation Prompts

The application prompts for the following:

- Operating system user name to be created
- Operating system group to be created
- Directory below the */opt* directory to be used by StarQuality,

- Profile file to be used
- Type of StarQuality installation

If the user and the directory already exist but the installer cannot find a valid StarQuality installation in the directory, then it asks whether it should continue or not. If it finds a StarQuality, it stops until all StarQuality modules are stopped.

The installer prompts for the installation type, that is, if you are installing an additional server. Answer No to this prompt.

```
------------------------------------------------------------------------
WARNING: !!! YOU SHOULD ONLY ANSWER YES TO THE FOLLOWING QUESTION!!!
WARNING: !!! IF YOU ARE INSTALLING AN ADDITIONAL (COLLECTOR) SERVER !!!
WARNING: !!! OR YOU ARE UPGRADING SUCH AN ADDITIONAL (COLLECTOR) SERVER !!!
QUESTION : Are you installing a collector server (Y/N) [N]:
------------------------------------------------------------------------
```

2.5.2.5 Apache Configuration

If you are not installing a data collector, the installer asks whether it should configure the Apache WEB server or you will configure it later. This question is among the few yes-no questions for which the installer stores the given answer and sets the default to your previous answer when running a second time, and can accept this default answer in silent mode automatically.

If you answer Yes, the installer asks for various Apache files and the port to be used, and then configures it. The default answers given to the user during the installation represent the answers for the default Apache installation according to the operating system.

```
------------------------------------------------------------------------
QUESTION : Do you want to configure the Apache WEB server (Y/N) [Y]: y
INFO     : Configuring Apache
QUESTION : On which port should Apache listen [80]:
QUESTION : Where is the Apache apachectl file [/usr/apache/bin/apachectl]:
QUESTION : Where is the Apache htpasswd file [/usr/apache/bin/htpasswd]:
QUESTION : Where is the Apache pid file [/var/run/apache/httpd.pid]:
QUESTION : Where is the Apache httpd.conf file [/etc/apache/httpd.conf]:
INFO     : Creating backup /etc/apache/httpd.conf.20090512-122852 from
/etc/apache/httpd.conf
```

```
INFO     : Stopping Apache

INFO     : Creating a new /etc/apache/httpd.conf

INFO     : Starting Apache

-------------------------------------------------------------------------
```

2.5.2.6 Automatic Starting and Stopping

The installer application places scripts in the appropriate folder so that StarQuality can be automatically started and stopped. Automatic start/stop in this case does not include Oracle. If you are not installing a data collector server then the installer asks whether the Oracle has to be automatically started and stopped by the same script as well. You should only answer Yes if the Oracle server is running on the same machine and there is no other script to start and stop Oracle. If the Oracle server is running on the same machine but such a script already exists then you have to make sure that StarQuality starts after the Oracle server and stops before the Oracle server. This question is among the few yes-no questions for which the installer stores the given answer and sets the default to your previous answer when running a second time, and can accept this default answer in silent mode automatically.

```
-------------------------------------------------------------------------

INFO     : Creating the service script, so the operating system can
automatically

INFO     : start and stop StarQuality

WARNING  : !!! YOU SHOULD ONLY ANSWER YES TO THE FOLLOWING QUESTION IF !!!

WARNING  : !!! THE ORACLE DATABASE RUNS ON THIS SERVER AND YOU DO NOT  !!!

WARNING  : !!! HAVE ALREADY A START/STOP SCRIPT FOR THE ORACLE         !!!

QUESTION : Should this script start/stop the Oracle server as well (Y/N)
[Y]: n

WARNING  : !!! IF THE ORACLE RUNS ON THIS SERVER THEN MAKE SURE THAT   !!!

WARNING  : !!! IT STARTS BEFORE THE APPLICATION AND STOPS AFTER THE    !!!

WARNING  : !!! APPLICATION                                             !!!

INFO     : Creating sym link /etc/rc0.d/K01starquality

INFO     : Creating sym link /etc/rc3.d/S99starquality

-------------------------------------------------------------------------
```

2.5.2.7 Creating the StarQuality Tablespaces in the Database and the Oracle User

The installer prompts for the following, and creates creates the tablespaces:

- Name, file name and size parameters for its configuration amd data tablespaces. Leave name and size as prompted but point to the partition as defined in the required Partitioning table.
- Name and password for its Oracle user.

```
------------------------------------------------------------------------

INFO     : Checking Oracle schema

INFO     : Getting the default tablespace directory

QUESTION : StarQuality Conf tablespace name [SQ_CONF]:

QUESTION : StarQuality Conf tablespace file
[C:\ORACLE\PRODUCT\10.2.0\ORADATA\ORCL\SQ_CONF.dbf]:

QUESTION : StarQuality Conf tablespace size [300M]:

INFO     : Creating the tablespace SQ_CONF, this could take several minutes

INFO     : Oracle tablespace SQ_CONF created

QUESTION : StarQuality Data tablespace name [SQ_DATA]:

QUESTION : StarQuality Data tablespace file
[C:\ORACLE\PRODUCT\10.2.0\ORADATA\ORCL\SQ_DATA.dbf]:

QUESTION : StarQuality Data tablespace size [10000M]:

INFO     : Creating the tablespace SQ_DATA, this could take several minutes

INFO     : Creating the tablespace SQ_DATA, this could take several minutes

INFO     : Oracle tablespace SQ_DATA created

QUESTION : StarQuality Oracle user name [SQ]:

QUESTION : StarQuality Oracle user password [******]:

INFO     : Creating the Oracle schema, this could take several minutes

INFO     : Oracle user SQ created
```

2.5.2.8 Finishing the Installation

1 The installer generates the schematic maps and exits.

```
------------------------------------------------------------------------

INFO     : Redrawing schematic maps
```

```
INFO     : Installer ended
-bash-3.00#
--------------------------------------------------------------------------
```

2 To load a licence and run StarQuality, refer to:

- “Loading a StarQuality Licence” on page 93
- “Running StarQuality on Solaris” on page 92.

2.6 Installing StarQuality on Solaris Server with External Oracle Database on the Same Machine

Before beginning the StarQuality installation refer to Table 2-1 to ensure that this is the correct installation for your system. Check that you have performed all the tasks outlined in Section 2.6.1 below.

This installation type involves configuration of the Solaris kernel parameters and the installation of the following components:

- Oracle server (Oracle client is not required)
- StarQuality

2.6.1 Pre-installation Tasks

2.6.1.1 Disk Partitioning

For medium network configurations, containing no more than 350 BTSs or 50,000 CPEs, disk partitioning is recommended, as described in the following table:

Table 2-11: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1	OS, StarQuality SW, Oracle SW
Physical disk 2	Volume 2 - RAID 0	Oracle tablespaces, redo logs, etc. (entire SID)
Physical disk 3		
Physical disk 4		

For large network configurations, containing no more than 1000 BTSs or 250,000 CPEs, disk partitioning is recommended, as described in the following table (Note that the HDDs have a capacity of 500 GB):

Table 2-12: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1	OS, StarQuality SW, Oracle SW
Physical disk 2	Volume 2 - RAID 0	Oracle tablespaces, redo logs, etc. (entire SID)
Physical disk 3		
Physical disk 4		
Physical disk 5		
Physical disk 6		
Physical disk 7		
Physical disk 8		
Physical disk 9		
Physical disk 10		

2.6.1.2 Configuring Kernel Parameters for Solaris x86

1 Add the following entries to the */etc/system* file and reboot the system:

```
set shmsys:shminfo_shmmax=4294967295
set shmsys:shminfo_shmmni=100
set semsys:seminfo_semmni=100
set semsys:seminfo_semmsl=256
```

2 Verify a minimum of 10 GB swap space

2.6.1.3 Configuring Network Ports

The following ports must be open between the server machine, client machine, managed network equipment and other NMS/OSS elements:

Table 2-13: Network Ports

Use	Port	Protocol	Direction
App. server and managed equipment	161	SNMP	Outbound towards NE
App. server, managed equipment and other NMS/OSS elements	162	SNMP	Outbound towards NMS/OSS elements
App. server and managed equipment	69	TFTP	From Managed equipment to StarQuality
App. server and client	8080		Inbound/Outbound between client and server
Sending requests to AlvariSTAR in order to reach KPI	16162	SNMP	

2.6.1.4 Installing Oracle Server

Follow these guidelines:

- Consult Table 2-1 for the correct Oracle Server version.
- Install Oracle Server according to instructions issued by Oracle corporation.
- Make sure that the database is set to a minimum of 170 processes.
- During StarQuality installation, the Oracle server must be running, and the database connection from the StarQuality should be available.
- To test connectivity to the database server from the StarQuality machine, use the *sqlplus* utility as follows:
  - » Assuming that the database SID is `testme`, and system password is `oracle`, switch to the command prompt (on Windows) or use a console (on Solaris, logged in as the Oracle user) and enter the following command: `sqlplus system/oracle@testme`. If the SQL prompt is displayed, connectivity to the database server is confirmed. Any error message should be reported to and resolved by the DBA.
  - » Enter `exit` or `quit` to complete the procedure.

- The following Oracle database information should be available when installing StarQuality:
  - Service name (SID)
  - TNS
  - Password for SYSTEM user

2.6.2 Installing StarQuality

StarQuality can be installed on a Solaris 10 x86 operating system using the command-line installer.

For additional information on the installer commands and parameters, refer to "Command Line Installer General Information" on page 96

All operations should be done while logged in as *root* user.

To install StarQuality (Solaris):

1. Run the installer application, *StarQuality.v3.0.en.bin*, either directly from the installation DVD or from a directory to which the file was transferred (using FTP).
2. Follow the next sections for installation details.

2.6.2.1 Basic Checks

The installer checks the following details:

- Version of the operating system
- Required packages
- Version of Perl and the options used to build the Perl binary,

If the application detects an error during these checks, then depending on the level of error, it either immediately terminates or asks whether it should continue or not. Always answer No and restart the installation.

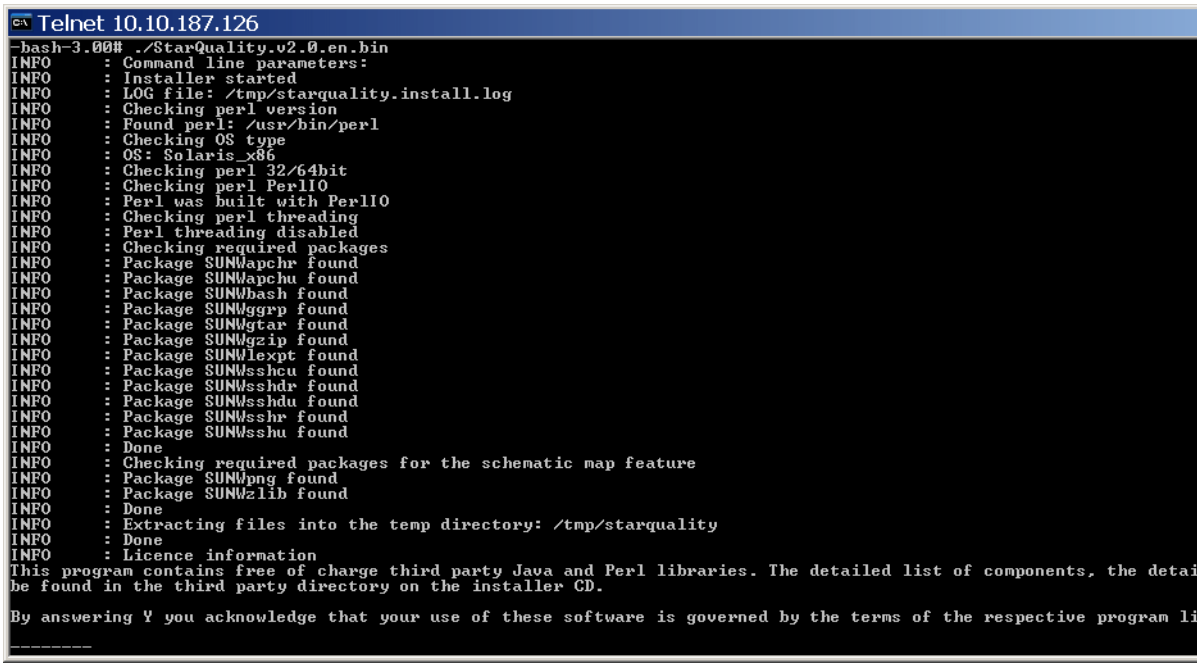

Telnet 10.10.187.126
-bash-3.00# ./StarQuality.v2.0.en.bin
INFO : Command line parameters:
INFO : Installer started
INFO : LOG file: /tmp/starquality.install.log
INFO : Checking perl version
INFO : Found perl: /usr/bin/perl
INFO : Checking OS type
INFO : OS: Solaris_x86
INFO : Checking perl 32/64bit
INFO : Checking perl PerlIO
INFO : Perl was built with PerlIO
INFO : Checking perl threading
INFO : Perl threading disabled
INFO : Checking required packages
INFO : Package SUNWapchr found
INFO : Package SUNWapchu found
INFO : Package SUNWbash found
INFO : Package SUNWggrp found
INFO : Package SUNWgtar found
INFO : Package SUNWgzip found
INFO : Package SUNWlexpt found
INFO : Package SUNWsshcu found
INFO : Package SUNWsshdr found
INFO : Package SUNWsshdu found
INFO : Package SUNWsshr found
INFO : Package SUNWsshu found
INFO : Done
INFO : Checking required packages for the schematic map feature
INFO : Package SUNWpng found
INFO : Package SUNWzlib found
INFO : Done
INFO : Extracting files into the temp directory: /tmp/starquality
INFO : Done
INFO : Licence information
This program contains free of charge third party Java and Perl libraries. The detailed list of components, the detai
be found in the third party directory on the installer CD.
By answering Y you acknowledge that your use of these software is governed by the terms of the respective program li
----

Figure 2-63: Installation on Solaris - Basic Checks

2.6.2.2 License Information

When the basic checks are complete, the license agreement is displayed. To scroll down the agreement, press either the spacebar or the Enter key.

Read the agreement carefully before accepting.

2.6.2.3 Connection Details of External Oracle Database

The application prompts for the operating system user used during the Oracle installation. After providing it, it tries to determine the value of the ORACLE_HOME environment variable using that user, and asks for confirmation.

```
-----------------------------------------------------------------------------------------------

QUESTION : The OS user of Oracle [oracle]:

INFO     : Found Oracle home:
"/export/home/AlvariSTAR/db/product/10.2.0/db_1"

QUESTION : ORACLE_HOME environment variable
[/export/home/AlvariSTAR/db/product/10.2.0/db_1]:

INFO     : Checking the Oracle home
/export/home/AlvariSTAR/db/product/10.2.0/db_1

INFO    : Oracle home /export/home/AlvariSTAR/db/product/10.2.0/db_1 seems
to be OK

INFO     : Checking Oracle version
```

```
INFO     : Found Oracle version 10

INFO     : Detected 64-bit Oracle

QUESTION : StarQuality OS user name [starq]:

INFO     : Found StarQuality in /opt/starquality

INFO     : Select user starq and group starq with directory
/opt/starquality

INFO     : Checking the environment of starq

INFO     : Environment checking is done

INFO     : Searching for running StarQuality modules

INFO     : Oracle checking

INFO     : Detected Solaris_x86 with 64 bit Oracle, so using full connect
string instead of TNS names

QUESTION : Oracle host name [localhost]:

QUESTION : Oracle port [1721]:

QUESTION : Oracle service name [BWANMS]:

QUESTION : Oracle SID [BWANMS]:

QUESTION : Oracle SYSTEM user password []:

CONFIRM  : Confirm the password:

ERROR    : Password mismatch

QUESTION : Oracle SYSTEM user password []:

CONFIRM  : Confirm the password:

INFO     : Attempting to tnsping localhost:1721

INFO     : Successful

INFO     : Attempting to login to Oracle with the SYSTEM user and the SID
BWANMS

INFO     : Successful

INFO     : Attempting to login to Oracle with the SYSTEM user and the
service name BWANMS

INFO     : Successful

INFO     : Oracle checking successful

INFO     : Configuring user SSH parameters

INFO     : Done

--------------------------------------------------------------------------
```

2.6.2.4 StarQuality Installation Prompts

The application prompts for the following:

- Operating system user name to be created
- Operating system group to be created
- Directory below the */opt* directory to be used by StarQuality,
- Profile file to be used
- Type of StarQuality installation

If the user and the directory already exist but the installer cannot find a valid StarQuality installation in the directory, then it asks whether it should continue or not. If it finds a StarQuality, it stops until all StarQuality modules are stopped.

The installer prompts for the installation type, that is, if you are installing an additional server. Answer No to this prompt.

```
------------------------------------------------------------------------
WARNING: !!! YOU SHOULD ONLY ANSWER YES TO THE FOLLOWING QUESTION!!!
WARNING: !!! IF YOU ARE INSTALLING AN ADDITIONAL (COLLECTOR) SERVER !!!
WARNING: !!! OR YOU ARE UPGRADING SUCH AN ADDITIONAL (COLLECTOR) SERVER !!!
QUESTION : Are you installing a collector server (Y/N) [N]:
------------------------------------------------------------------------
```

2.6.2.5 Apache Configuration

If you are not installing a data collector, the installer asks whether it should configure the Apache WEB server or you will configure it later. This question is among the few yes-no questions for which the installer stores the given answer and sets the default to your previous answer when running a second time, and can accept this default answer in silent mode automatically.

If you answer Yes, the installer asks for various Apache files and the port to be used, and then configures it. The default answers given to the user during the installation represent the answers for the default Apache installation according to the operating system.

```
------------------------------------------------------------------------
QUESTION : Do you want to configure the Apache WEB server (Y/N) [Y]: y
INFO     : Configuring Apache
QUESTION : On which port should Apache listen [80]:
QUESTION : Where is the Apache apachectl file [/usr/apache/bin/apachectl]:
```

```
QUESTION : Where is the Apache htpasswd file [/usr/apache/bin/htpasswd]:

QUESTION : Where is the Apache pid file [/var/run/apache/httpd.pid]:

QUESTION : Where is the Apache httpd.conf file [/etc/apache/httpd.conf]:

INFO     : Creating backup /etc/apache/httpd.conf.20090512-122852 from
/etc/apache/httpd.conf

INFO     : Stopping Apache

INFO     : Creating a new /etc/apache/httpd.conf

INFO     : Starting Apache
------------------------------------------------------------------------
```

2.6.2.6 Automatic Starting and Stopping

The installer application places scripts in the appropriate folder so that StarQuality can be automatically started and stopped. Automatic start/stop in this case does not include Oracle. If you are not installing a data collector server then the installer asks whether the Oracle has to be automatically started and stopped by the same script as well. You should only answer Yes if the Oracle server is running on the same machine and there is no other script to start and stop Oracle. If the Oracle server is running on the same machine but such a script already exists then you have to make sure that StarQuality starts after the Oracle server and stops before the Oracle server. This question is among the few yes-no questions for which the installer stores the given answer and sets the default to your previous answer when running a second time, and can accept this default answer in silent mode automatically.

```
------------------------------------------------------------------------

INFO     : Creating the service script, so the operating system can
automatically

INFO     : start and stop StarQuality

WARNING  : !!! YOU SHOULD ONLY ANSWER YES TO THE FOLLOWING QUESTION IF !!!

WARNING  : !!! THE ORACLE DATABASE RUNS ON THIS SERVER AND YOU DO NOT  !!!

WARNING  : !!! HAVE ALREADY A START/STOP SCRIPT FOR THE ORACLE         !!!

QUESTION : Should this script start/stop the Oracle server as well (Y/N)
[Y]: n

WARNING  : !!! IF THE ORACLE RUNS ON THIS SERVER THEN MAKE SURE THAT   !!!

WARNING  : !!! IT STARTS BEFORE THE APPLICATION AND STOPS AFTER THE    !!!

WARNING  : !!! APPLICATION                                            !!!

INFO     : Creating sym link /etc/rc0.d/K01starquality
```

```
INFO     : Creating sym link /etc/rc3.d/S99starquality

------------------------------------------------------------------------
```

2.6.2.7 Creating the StarQuality Tablespaces in the Database and the Oracle User

The installer prompts for the following, and creates creates the tablespaces:

- Name, file name and size parameters for its configuration amd data tablespaces. Leave name and size as prompted but point to the partition as defined in the required Partitioning table.
- Name and password for its Oracle user.

```
------------------------------------------------------------------------

INFO     : Checking Oracle schema

INFO     : Getting the default tablespace directory

QUESTION : StarQuality Conf tablespace name [SQ_CONF]:

QUESTION : StarQuality Conf tablespace file
[C:\ORACLE\PRODUCT\10.2.0\ORADATA\ORCL\SQ_CONF.dbf]:

QUESTION : StarQuality Conf tablespace size [300M]:

INFO     : Creating the tablespace SQ_CONF, this could take several minutes

INFO     : Oracle tablespace SQ_CONF created

QUESTION : StarQuality Data tablespace name [SQ_DATA]:

QUESTION : StarQuality Data tablespace file
[C:\ORACLE\PRODUCT\10.2.0\ORADATA\ORCL\SQ_DATA.dbf]:

QUESTION : StarQuality Data tablespace size [10000M]:

INFO     : Creating the tablespace SQ_DATA, this could take several minutes

INFO     : Creating the tablespace SQ_DATA, this could take several minutes

INFO     : Oracle tablespace SQ_DATA created

QUESTION : StarQuality Oracle user name [SQ]:

QUESTION : StarQuality Oracle user password [******]:

INFO     : Creating the Oracle schema, this could take several minutes

INFO     : Oracle user SQ created
```

2.6.2.8 Finishing the Installation

1 The installer generates the schematic maps and exits.

```
------------------------------------------------------------------------
INFO     : Redrawing schematic maps
INFO     : Installer ended
-bash-3.00#
------------------------------------------------------------------------
```

2 To load a licence and run StarQuality, refer to:

- » “Loading a StarQuality Licence” on page 93
- » “Running StarQuality on Solaris” on page 88.

2.7 Installing StarQuality on Solaris Server with Oracle Database on a Separate Machine

Before beginning the StarQuality installation refer to Table 2-1 to ensure that this is the correct installation for your system. Check that you have performed all the tasks outlined in Section 2.7.1 below.

This installation type involves configuration of the Solaris kernel parameters and the installation of the following components:

- Oracle server *on a separate machine*
- Oracle client *on the StarQuality machine*
- StarQuality

2.7.1 Pre-installation Tasks

2.7.1.1 Disk Partitioning

For large network configurations using external Oracle setups, disk partitioning is recommended:

Table 2-14: Disk Partitioning

Physical Disk	Volume	Setup
Physical disk 1	Volume 1- RAID 0	OS, Star Quality SW, Oracle client SW
Physical disk 2		
Physical disk 3		
Physical disk 4		

2.7.1.2 Configuring Network Ports

The following ports must be open between the server machine, client machine, managed network equipment and other NMS/OSS elements:

Table 2-15: Network Ports

Use	Port	Protocol	Direction
App. server and managed equipment	161	SNMP	Outbound towards NE
App. server, managed equipment and other NMS/OSS elements	162	SNMP	Outbound towards NMS/OSS elements
App. server and managed equipment	69	TFTP	From Managed equipment to StarQuality
App. server and client	8080		Inbound/Outbound between client and server
Oracle communication client - server	As installed (Default: 1521)		From StarQuality to Oracle and from Oracle to StarQuality
Sending requests to AlvariSTAR in order to reach KPI	16162	SNMP	

2.7.1.3 Installing Oracle

Follow these guidelines:

- Consult Table 2-1 for the correct Oracle Server/Client versions.
- Install Oracle Server on a standalone Oracle machine according to instructions issued by Oracle corporation. Make sure that the database is set to a minimum of 170 processes.
- Install Oracle client using the Administrator type installation.
- When completing the Oracle client installation, use the Oracle Net Configuration Assistant to create a connection to the Database server, and test it.
- During StarQuality installation, the Oracle server must be running, and the database connection from the StarQuality machine should be available.

- To test connectivity to the database server from the StarQuality machine, use the *sqlplus* utility as follows:
  - Assuming that the database SID is `testme`, and system password is `oracle`, switch to the command prompt (on Windows) or use a console (on Solaris, logged in as the Oracle user) and enter the following command: `sqlplus system/oracle@testme`.
  - Enter `exit` or `quit` to complete the procedure.
- The following Oracle database information should be available when installing the StarQuality:
  - Oracle Database server IP
  - Service name (SID)
  - TNS
  - Password for SYSTEM use

2.7.2 Installing StarQuality

StarQuality can be installed on a Solaris 10 x86 operating system using the command-line installer.

For additional information on the installer commands and parameters, refer to "Command Line Installer General Information" on page 96

All operations should be done while logged in as *root* user.

To install StarQuality (Solaris):

1. Run the installer application, *StarQuality.v3.0.en.bin*, either directly from the installation DVD or from a directory to which the file was transferred (using FTP).
2. Follow the next sections for installation details.

2.7.2.1 Basic Checks

The installer checks the following details:

- Version of the operating system
- Required packages
- Version of Perl and the options used to build the Perl binary,

If the application detects an error during these checks, then depending on the level of error, it either immediately terminates or asks whether it should continue or not. Always answer No and restart the installation.

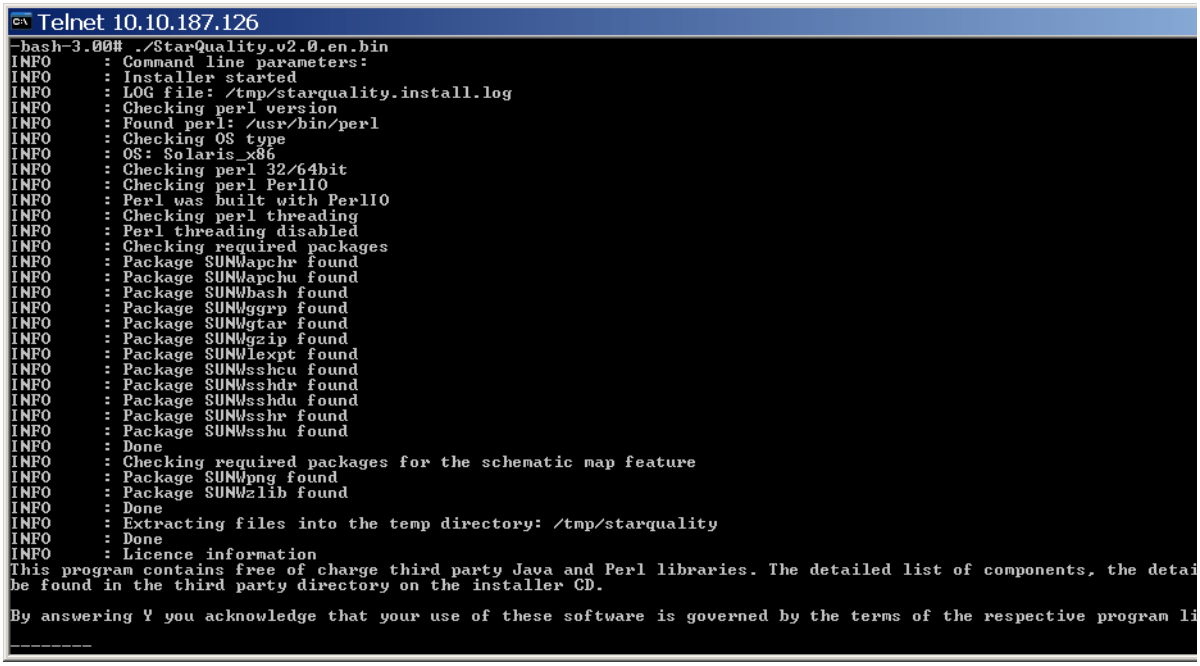

Telnet 10.10.187.126
-bash-3.00# ./StarQuality.v2.0.en.bin
INFO : Command line parameters:
INFO : Installer started
INFO : LOG file: /tmp/starquality.install.log
INFO : Checking perl version
INFO : Found perl: /usr/bin/perl
INFO : Checking OS type
INFO : OS: Solaris_x86
INFO : Checking perl 32/64bit
INFO : Checking perl PerlIO
INFO : Perl was built with PerlIO
INFO : Checking perl threading
INFO : Perl threading disabled
INFO : Checking required packages
INFO : Package SUNWapchr found
INFO : Package SUNWapchu found
INFO : Package SUNWbash found
INFO : Package SUNWggrp found
INFO : Package SUNWgtar found
INFO : Package SUNWgzip found
INFO : Package SUNWlexpt found
INFO : Package SUNWsshcu found
INFO : Package SUNWsshdr found
INFO : Package SUNWsshdu found
INFO : Package SUNWsshr found
INFO : Package SUNWsshu found
INFO : Done
INFO : Checking required packages for the schematic map feature
INFO : Package SUNWpng found
INFO : Package SUNWzlib found
INFO : Done
INFO : Extracting files into the temp directory: /tmp/starquality
INFO : Done
INFO : Licence information
This program contains free of charge third party Java and Perl libraries. The detailed list of components, the detai
be found in the third party directory on the installer CD.
By answering Y you acknowledge that your use of these software is governed by the terms of the respective program li
----

Figure 2-64: Installation on Solaris - Basic Checks

2.7.2.2 License Information

When the basic checks are complete, the license agreement is displayed. To scroll down the agreement, press either the spacebar or the Enter key.

Read the agreement carefully before accepting.

2.7.2.3 Connection Details of External Oracle Database

The application prompts for the operating system user used during the Oracle installation. After providing it, it tries to determine the value of the ORACLE_HOME environment variable using that user, and asks for confirmation.

```
QUESTION : The OS user of Oracle [oracle]:

INFO     : Found Oracle home:
"/export/home/AlvariSTAR/db/product/10.2.0/db_1"

QUESTION : ORACLE_HOME environment variable
[/export/home/AlvariSTAR/db/product/10.2.0/db_1]:

INFO     : Checking the Oracle home
/export/home/AlvariSTAR/db/product/10.2.0/db_1

INFO    : Oracle home /export/home/AlvariSTAR/db/product/10.2.0/db_1 seems
to be OK

INFO     : Checking Oracle version

INFO     : Found Oracle version 10

INFO     : Detected 64-bit Oracle

QUESTION : StarQuality OS user name [starq]:

INFO     : Found StarQuality in /opt/starquality

INFO     : Select user starq and group starq with directory
/opt/starquality

INFO     : Checking the environment of starq

INFO     : Environment checking is done

INFO     : Searching for running StarQuality modules

INFO     : Oracle checking

INFO     : Detected Solaris_x86 with 64 bit Oracle, so using full connect
string instead of TNS names

QUESTION : Oracle host name [localhost]:

QUESTION : Oracle port [1721]:

QUESTION : Oracle service name [BWANMS]:

QUESTION : Oracle SID [BWANMS]:

QUESTION : Oracle SYSTEM user password []:

CONFIRM  : Confirm the password:

ERROR    : Password mismatch

QUESTION : Oracle SYSTEM user password []:

CONFIRM  : Confirm the password:

INFO     : Attempting to tnsping localhost:1721

INFO     : Successful

INFO     : Attempting to login to Oracle with the SYSTEM user and the SID
BWANMS

INFO     : Successful

INFO     : Attempting to login to Oracle with the SYSTEM user and the
service name BWANMS
```

```
INFO     : Successful
INFO     : Oracle checking successful
INFO     : Configuring user SSH parameters
INFO     : Done
------------------------------------------------------------------------
```

2.7.2.4 StarQuality Installation Prompts

The application prompts for the following:

- Operating system user name to be created
- Operating system group to be created
- Directory below the */opt* directory to be used by StarQuality,
- Profile file to be used
- Type of StarQuality installation

If the user and the directory already exist but the installer cannot find a valid StarQuality installation in the directory, then it asks whether it should continue or not. If it finds a StarQuality, it stops until all StarQuality modules are stopped.

The installer prompts for the installation type, that is, if you are installing an additional server. Answer No to this prompt.

```
------------------------------------------------------------------------
WARNING: !!! YOU SHOULD ONLY ANSWER YES TO THE FOLLOWING QUESTION!!!
WARNING: !!! IF YOU ARE INSTALLING AN ADDITIONAL (COLLECTOR) SERVER !!!
WARNING: !!! OR YOU ARE UPGRADING SUCH AN ADDITIONAL (COLLECTOR) SERVER !!!
QUESTION : Are you installing a collector server (Y/N) [N]:
------------------------------------------------------------------------
```

2.7.2.5 Apache Configuration

If you are not installing a data collector, the installer asks whether it should configure the Apache WEB server or you will configure it later. This question is among the few yes-no questions for which the installer stores the given answer and sets the default to your previous answer when running a second time, and can accept this default answer in silent mode automatically.

If you answer Yes, the installer asks for various Apache files and the port to be used, and then configures it. The default answers given to the user during the installation represent the answers for the default Apache installation according to the operating system.

```
-------------------------------------------------------------------------

QUESTION : Do you want to configure the Apache WEB server (Y/N) [Y]: y

INFO     : Configuring Apache

QUESTION : On which port should Apache listen [80]:

QUESTION : Where is the Apache apachectl file [/usr/apache/bin/apachectl]:

QUESTION : Where is the Apache htpasswd file [/usr/apache/bin/htpasswd]:

QUESTION : Where is the Apache pid file [/var/run/apache/httpd.pid]:

QUESTION : Where is the Apache httpd.conf file [/etc/apache/httpd.conf]:

INFO     : Creating backup /etc/apache/httpd.conf.20090512-122852 from
/etc/apache/httpd.conf

INFO     : Stopping Apache

INFO     : Creating a new /etc/apache/httpd.conf

INFO     : Starting Apache

-------------------------------------------------------------------------
```

2.7.2.6 Automatic Starting and Stopping

The installer application places scripts in the appropriate folder so that StarQuality can be automatically started and stopped. Automatic start/stop in this case does not include Oracle. If you are not installing a data collector server then the installer asks whether the Oracle has to be automatically started and stopped by the same script as well. You should only answer Yes if the Oracle server is running on the same machine and there is no other script to start and stop Oracle. If the Oracle server is running on the same machine but such a script already exists then you have to make sure that StarQuality starts after the Oracle server and stops before the Oracle server. This question is among the few yes-no questions for which the installer stores the given answer and sets the default to your previous answer when running a second time, and can accept this default answer in silent mode automatically.

```
-------------------------------------------------------------------------

INFO     : Creating the service script, so the operating system can
automatically

INFO     : start and stop StarQuality

WARNING  : !!! YOU SHOULD ONLY ANSWER YES TO THE FOLLOWING QUESTION IF !!!
```

```
WARNING  : !!! THE ORACLE DATABASE RUNS ON THIS SERVER AND YOU DO NOT  !!!
WARNING  : !!! HAVE ALREADY A START/STOP SCRIPT FOR THE ORACLE         !!!
QUESTION : Should this script start/stop the Oracle server as well (Y/N)
[Y]: n
WARNING  : !!! IF THE ORACLE RUNS ON THIS SERVER THEN MAKE SURE THAT   !!!
WARNING  : !!! IT STARTS BEFORE THE APPLICATION AND STOPS AFTER THE    !!!
WARNING  : !!! APPLICATION                                             !!!
INFO     : Creating sym link /etc/rc0.d/K01starquality
INFO     : Creating sym link /etc/rc3.d/S99starquality
------------------------------------------------------------------------
```

2.7.2.7 Creating the StarQuality Tablespaces in the Database and the Oracle User

The installer prompts for the following, and creates creates the tablespaces:

- Name, file name and size parameters for its configuration amd data tablespaces. Leave name and size as prompted but point to the partition as defined in the required Partitioning table.
- Name and password for its Oracle user.

```
------------------------------------------------------------------------
INFO     : Checking Oracle schema
INFO     : Getting the default tablespace directory
QUESTION : StarQuality Conf tablespace name [SQ_CONF]:
QUESTION : StarQuality Conf tablespace file
[C:\ORACLE\PRODUCT\10.2.0\ORADATA\ORCL\SQ_CONF.dbf]:
QUESTION : StarQuality Conf tablespace size [300M]:
INFO     : Creating the tablespace SQ_CONF, this could take several minutes
INFO     : Oracle tablespace SQ_CONF created
QUESTION : StarQuality Data tablespace name [SQ_DATA]:
QUESTION : StarQuality Data tablespace file
[C:\ORACLE\PRODUCT\10.2.0\ORADATA\ORCL\SQ_DATA.dbf]:
QUESTION : StarQuality Data tablespace size [10000M]:
INFO     : Creating the tablespace SQ_DATA, this could take several minutes
INFO     : Creating the tablespace SQ_DATA, this could take several minutes
```

```
INFO     : Oracle tablespace SQ_DATA created
QUESTION : StarQuality Oracle user name [SQ]:
QUESTION : StarQuality Oracle user password [******]:
INFO     : Creating the Oracle schema, this could take several minutes
INFO     : Oracle user SQ created
```

2.7.2.8 Finishing the Installation

1 The installer generates the schematic maps and exits.

```
------------------------------------------------------------------------
INFO     : Redrawing schematic maps
INFO     : Installer ended
-bash-3.00#
------------------------------------------------------------------------
```

2 To load a licence and run StarQuality, refer to:

- “Loading a StarQuality Licence” on page 93
- “Running StarQuality on Solaris” on page 88.

2.8 Running StarQuality

2.8.1 Running StarQuality on Windows

To start the server following initial installation:

1 Open a Cygwin shell and enter the command (by default it is not required to start it manually):

```
/usr/sbin/apachectl start
```

NOTE

If the Apache is started this way, the Cygwin shell should remain open. Closing it will cause the Apache service to shut down.

2 Open a web browser and go to http://<ip or hostname>/.

3 Enter User Name and Password. The default admin users credentials are:

```
admin
admin123
```

The StarQuality opening window is displayed for a few seconds and then the main interface window opens.

4 From Settings select Servers > Licenses. The Licences Configuration window is displayed. The entries marked red indicate missing or invalid licences that should be replaced.

5 If necessary, load a new license file using the WEB GUI (See “To load a licence:” on page 93.)

6 Do one of the following:

- In the computer service management window (myComputer > Manage > Services) start the services 'CYGWIN sshd' and 'StarQuality service'.
- In the WEB GUI, from Settings select Servers > Start/Stop/Status, click [**start all**]. Wait for the list to refresh.
- Return to the cygwin shell and enter the command:

```
/opt/starquality/bin/start_stop_pvsr start
```

7 In the WEB GUI, from Settings select Server > Start/Stop/Status, click [**check all]**, wait for all the entries to refresh and verify that all the entries are green.

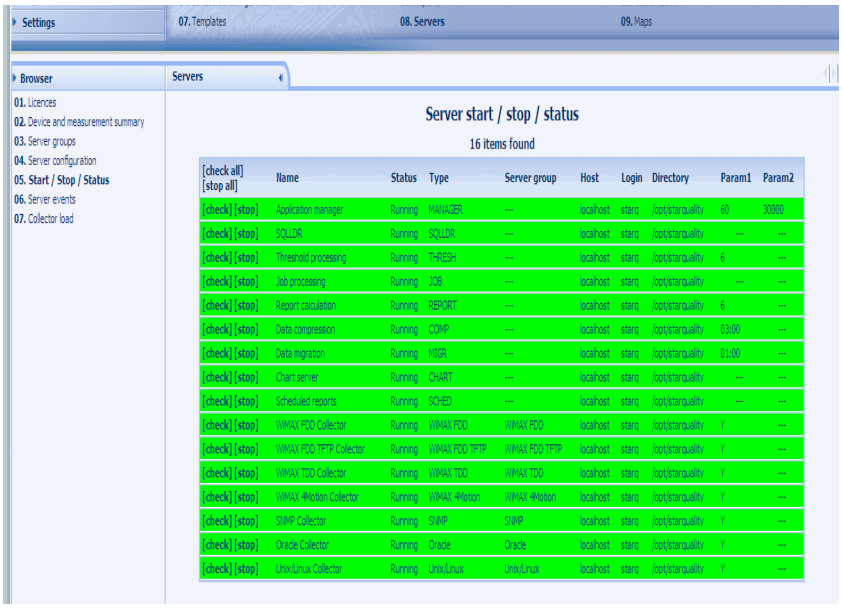


Figure 2-65: Server Status Window

To stop the StarQuality server:

1 Do one of the following:

- In the computer Service Management window (myComputer > Manage > Services) stop the service 'CYGWIN sshd'.
- Open a Cygwin shell and enter the commands:

```
/usr/sbin/apachectl stop
/opt/starquality/bin/start_stop_pvsr stop
```

- In the WEB GUI, from Settings select Servers > Start/Stop/Status, click [**stop all**]. Wait for the list to refresh.

2 In the WEB GUI, from Settings select Servers > Start/Stop/Status, click **[check all]**, wait for all the entries to refresh and verify that all the entries are red.

2.8.2 Running StarQuality on Solaris

To start the server following initial installation:

1 While logged in as root user enter the command (by default it is not required to start it manually):

```
/usr/apache/bin/apachectl start
```

Actual path may vary according to the Apache configuration. See “Apache Configuration” on page 67.

2 Open a web browser and go to http://<ip or hostname>/.

3 Enter User Name and Password. The default admin users credentials are:

```
admin
```

```
admin123
```

The StarQuality opening window is displayed for a few moments and then the main interface window opens. A message alerting a missing licence may appear, click **OK** and load a licence (see Step 5).

4 From Settings select Servers > Licenses. The Licences Configuration window is displayed. Check that all the entries are not marked red, which indicates invalid licences that should be replaced.

5 If necessary, load a new license file using the WEB GUI (see “Loading a StarQuality Licence” on page 93)

6 Do one of the following:

- Return to the StarQuality server machine console and enter the command:

```
/etc/init.d/starquality start
```

- In the WEB GUI, from Settings select Servers > Start/Stop/Status, click [**start all**]. Wait for the list to refresh.

7 In the WEB GUI, from Settings select Servers > Start/Stop/Status, click [**Check all**], wait for all the entries to refresh and verify that all the entries are green.

To stop the server:

1 While logged in as root user enter the command:

```
/usr/apache/bin/apachectl stop
```

Actual path may vary according to the Apache configuration. See "Apache Configuration" on page 67.

2 Do one of the following:

- Return to the StarQuality server machine console and enter the command:

```
/etc/init.d/starquality stop
```

- In the WEB GUI, from Settings select Servers > Start/Stop/Status, click [**stop all**]. Wait for the list to refresh.

3 In the WEB GUI, from Settings select Servers > Start/Stop/Status, click **[check all]**, wait for all the entries to refresh and verify that all the entries are red.

2.8.3 Loading a StarQuality Licence

To load a licence:

1 Place the licence file on the computer from which you activated the client.

2 From Settings select Servers > Licenses. The Licences Configuration window is displayed.

3 Click **[Add new]** and browse for the file containing the license.

4 Click **OK**. A list detailing the licenses is displayed.

5 Verify that none of the entries in the license list are colored red.

NOTE

Depending on what license is present before the upgrade, the new license might deactivate the collection on certain collectors; Click **Reactivate eqs** to start the collection on all devices (see Figure 2-66). A message will appear showing how many devices were activated.

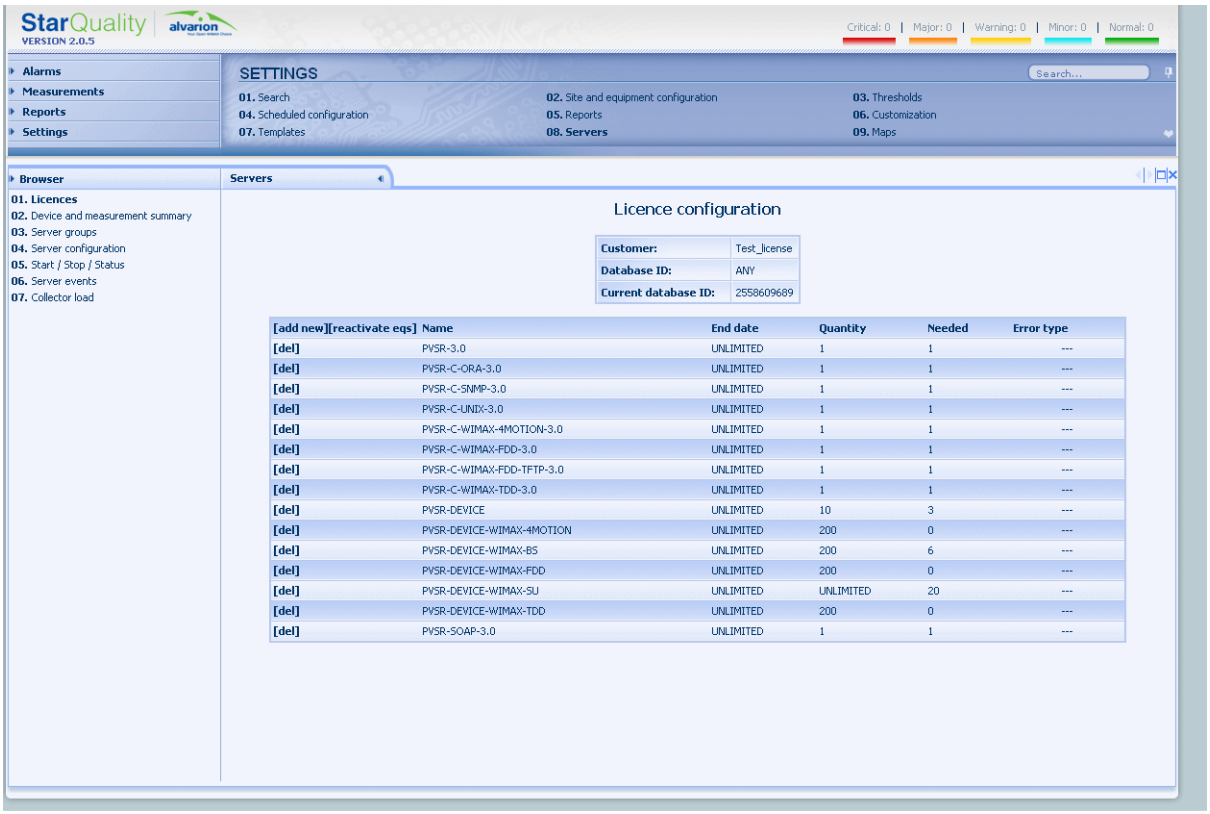


Figure 2-66: Licence Configuration Window

2.9 Additional Installation Information

2.9.1 Firewall Settings

For proper operation of StarQuality, the following connections should be enabled on the firewall between the system components:

Table 2-16: Firewall Settings

From	To	Port
StarQuality server (server running all modules, including the WEB interface and the data collector components too)	StarQuality Oracle server	Oracle SQL*Net (by default TCP 1521)
User machines	StarQuality WEB server	HTTP and/or HTTPS (by default TCP 80 and 443)
StarQuality WEB server	StarQuality WEB server	The port of the chart server, by default TCP 4444 The chart server module should always be located on a WEB server, so the connection need to be made only on the local machine
StarQuality application manager and SQLLDR module server	SMTP server	SMTP port (TPC 25)
StarQuality server	Measured equipments	SNMP port (UDP 161)
StarQuality server	External trap receiver	SNMP trap port (UDP 162)
StarQuality measurement server	Measured Unix/Linux equipments	SSH (TCP 22)
StarQuality measurement server	Measured Oracle equipments	Oracle SQL*Net (by default TCP 1521)
Machines using SOAP interface	PVSR SOAP module server	Port of the SOAP server, by default TCP 8082

2.9.2 Mail Server Configuration

1 Open the file *CONFIG_INI.PM*

- Windows: *C:\cygwin\opt\starquality\etc*
- Solaris: */opt/starquality/etc*

2 If required, edit the following fields:

```
$SMTP_SERVER='localhost';
$PVSR_EMAIL_ADDRESS='StarQuality';
#$SMTP_AUTH='user/pwd';
```

» SMTP_SERVER: IP of the SMTP server through which the application sends the e-mails. If this is not entered, e-mails will not be sent.

NOTE

The SMTP server has to comply with the following:

- Connection between StarQuality and the server on Port 25.
- If the SMTP server requires username and password, fill them in the SMTP_AUTH clause, and delete the hash sign from its line beginning.

» PVSR_EMAIL_ADDRESS: this address will be used as the sender for outgoing e-mail messages. If it is not specified, it is automatically set to StarQuality@<hostname>, while if the specified value does not contain the @ sign, then the <specified value>@<hostname> is used

» SMTP_AUTH - in cases of SMTP server which requires username and password, delete the # sign and add the username and password in <'user/pwd'> format.

3 Configure the server to send e-mail notifications about admin events:

```
$ADMIN_EMAIL_ADDRESSES='';
```

» ADMIN_EMAIL_ADDRESSES: a list of e-mail addresses separated by commas, to which the system sends e-mails regarding administrative information (for example: server up or down).

2.9.3 Command Line Installer General Information

2.9.3.1 Input Parameters

The application has several input options:

- `-h` or `-help`: displays the different input options
- `-c` or `-compatible`: displays the different operating system/Oracle versions supported by the installer

- `-d` or `-debug`: the installer application displays different log messages. The DEBUG level logging can be turned on using this option. The DEBUG messages appear in the log file */tmp/pvsr.install.log* (even if the option is not on).

- `-s` or `-silent`: the installer prompts various questions during the installation. If the silent mode is turned on, and the installer prompts a question other than a yes-no question, for which it has a default answer, then it continues automatically, so the user does not have to accept the default answer manually.

  Regarding yes-no questions, however, the installer does not accept the default answer for a yes-no question even in silent mode. There are only a handful exceptions to this, but only when the yes-no question was answered during a previous installer running. This behavior will be noted at the particular yes-no questions later.

- `-a=file_name`: the installer takes the default answers from the specified file. The installer writes the answers to the */var/pvsr/answer file* (except the passwords) and it reads them from that file by default.

2.9.3.2 Messages, Questions and Answers during the Installation

The application saves the log messages in the /tmp/pvsr.install file during the installation. The DEBUG messages appear in this file even if the -d or -debug option wasn't specified. The application uses the following log levels: ERROR, WARNING, INFO, DEBUG and QUESTION. In case of a question the application displays the default answer between square brackets - [and] - if such answer exists. If the installer asks for a password and such a default answer exists then it displays asterisks instead of the actual value.

2.9.3.3 Canceling or Stopping the Installation while Running

If during the installation you do not want to, or cannot move forward, the installer offers the uninstallation of the components that have been installed during this last installer running. You may choose to retain those components, since the installer can be run more than once. Moreover, if a previous StarQuality is detected, then the installer takes the default values from that installation and switches to upgrade mode automatically.

To cancel or stop the installation:

1 If the installer is waiting for an answer to a question, answer the original question.

2 Press Ctrl-C on the keyboard, followed by Enter.

2.9.4 Activating SOAP Server

A licence including the SOAP feature is a prerequisite to creating and activating the SOAP server.

To check that a licence for SOAP is available, from Settings select Servers > Licences. Verify that there is a line including SOAP server, and it is not colored red.

Refer to *StarQuality SOAP Manual* for more information on SOAP.

To activate the SOAP server:

1 From Settings select Servers > Server Configuration. A list of available servers is displayed.

2 Click [Add new] at the top-left corner of the list. The Server Configuration window is displayed.

Figure 2-67: Configuring SOAP Server

3 Fill-in the following fields:

- Name: free text

- Type: Select: Other > SOAP

- Host, Login, Password and Directory: copy the values from the Scheduled Reports sever.

4 Go to Start/Stop/Status. The SOAP entry it is red. Click **Start** to activate the new server. Verify it turns green.

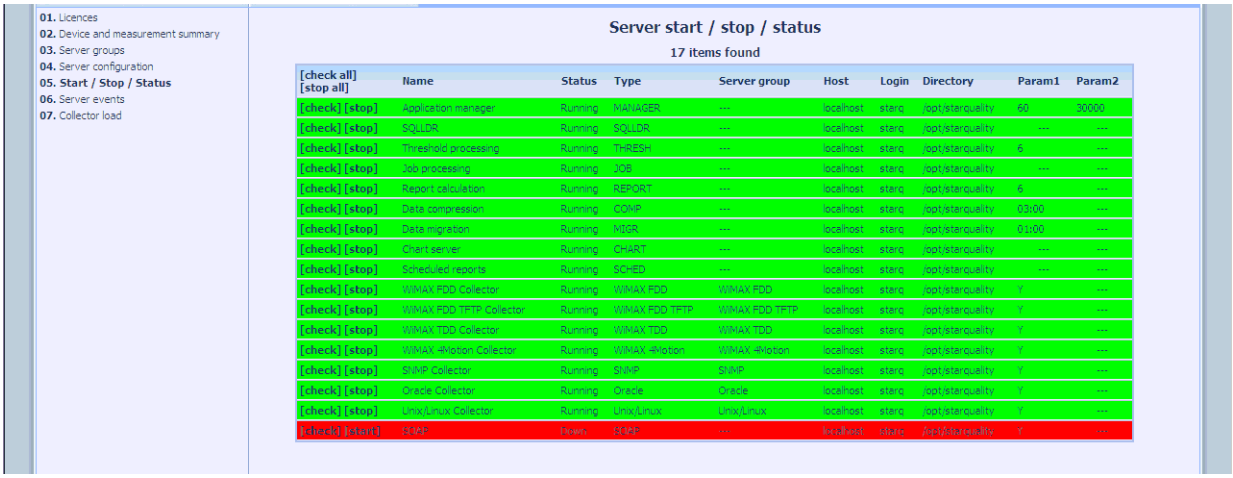

01. Licences
02. Device and measurement summary
03. Server groups
04. Server configuration
05. Start / Stop / Status
06. Server events
07. Collector load
Server start / stop / status
17 items found
[check all] [stop all]
Name
Status
Type
Server group
Host
Login
Directory
Param1
Param2
[check] [stop] Application manager Running MANAGER --- localhost starq /opt/starquality 60 30000
[check] [stop] SQLLDR Running SQLLDR --- localhost starq /opt/starquality --- ---
[check] [stop] Threshold processing Running THRESH --- localhost starq /opt/starquality 6 ---
[check] [stop] Job processing Running JOB --- localhost starq /opt/starquality --- ---
[check] [stop] Report calculation Running REPORT --- localhost starq /opt/starquality 6 ---
[check] [stop] Data compression Running COMP --- localhost starq /opt/starquality 03:00 ---
[check] [stop] Data migration Running MIGR --- localhost starq /opt/starquality 01:00 ---
[check] [stop] Chart server Running CHART --- localhost starq /opt/starquality --- ---
[check] [stop] Scheduled reports Running SCHED --- localhost starq /opt/starquality --- ---
[check] [stop] WiMAX FDD Collector Running WiMAX FDD WiMAX FDD localhost starq /opt/starquality Y ---
[check] [stop] WiMAX FDD TFTP Collector Running WiMAX FDD TFTP WiMAX FDD TFTP localhost starq /opt/starquality Y ---
[check] [stop] WiMAX TDD Collector Running WiMAX TDD WiMAX TDD localhost starq /opt/starquality Y ---
[check] [stop] WiMAX 4Motion Collector Running WiMAX 4Motion WiMAX 4Motion localhost starq /opt/starquality Y ---
[check] [stop] SNMP Collector Running SNMP SNMP localhost starq /opt/starquality Y ---
[check] [stop] Oracle Collector Running Oracle Oracle localhost starq /opt/starquality Y ---
[check] [stop] Unix/Linux Collector Running Unix/Linux Unix/Linux localhost starq /opt/starquality Y ---
[check] [start] SOAP Down SOAP --- localhost starq /opt/starquality Y ---

Figure 2-68: Server Start/Stop/Status - SOAP Entry

2.9.5 Configuration Parameters

- The new 4Motion measurements which do not have values for the ver.2.5M devices can be hidden under the Measurement menu.

- There is an option to keep every XML file for one week in the */opt/starquality/tmp/xml_archive* directory.

Contact Alvarion's customer service for more information.

2.10 StarQuality Upgrade

The upgrade has to be performed by an administrator user.

Upgrade is available between immediate/adjacent versions only.

Stop the StarQuality service and processes prior to upgrade.

IMPORTANT

If you are running an upgrade, the installer may not keep the StarQuality files or existing collected data. Therefore, prior to upgrade, make sure to check the Release Notes for version specific information.

2.10.1 StarQuality Upgrade on Windows

To upgrade StarQuality (Windows):

1. Perform Stop Services as follows:
   a. On the desktop right-click My Computer and select Manage .
   b. Select Services and Applications > Services.
   c. Right-click on StarQuality Service and select Stop
2. Run the installation program *starquality.exe*; The installation wizard is displayed.
3. Follow the installtion instructions on the screen. The wizard runs as in the regular installation procedure until it reaches the StarQuality Schema Update window, which indicates that this is an upgrade. Click **Next**.

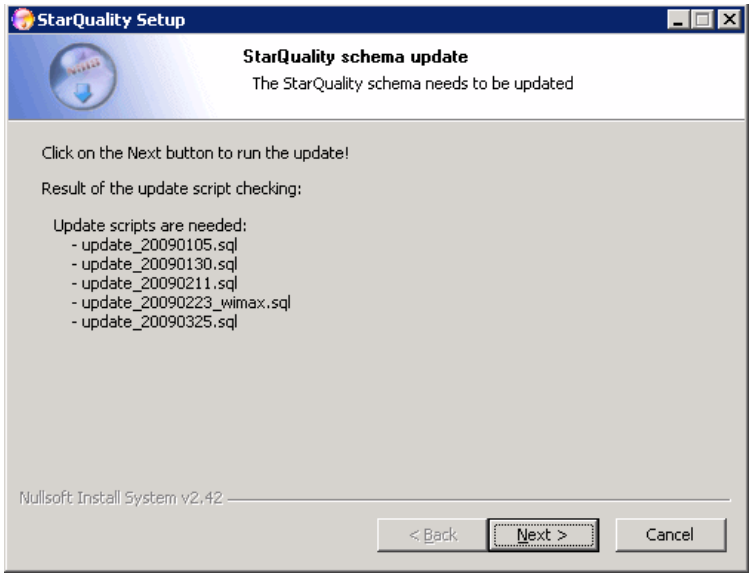


Figure 2-69: StarQuality Schema Update Window

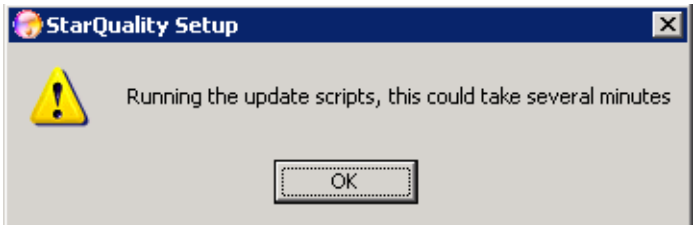


Figure 2-70: Setup Message

4 Click **OK** to the Setup message and wait for the installation to complete. Click **Finish**.

5 Proceed as in regular installation:

- Load a new licence that matches the new version (see "To load a licence:" on page 93)

NOTE

Depending on what license is present before the upgrade, the new license might deactivate the collection on certain collectors; Click **Reactivate eqs** in the Licence Configuration Window to start the collection on all devices (see Figure 2-66). A message will appear showing how many devices were activated.

- Start the servers (see "To start the server following initial installation:" on page 90)

2.10.2 StarQuality Upgrade on Solaris

The upgrade has to be performed by an administrator user.

Upgrade is available between immediate/adjacent versions only.

Stop the StarQuality service and processes prior to upgrade.

To upgrade StarQuality (Solaris):

1 Perform Stop Services as follows:

   a While logged in as root user enter the command:

   `/usr/apache/bin/apachectl stop`

   Actual path may vary according to the Apache configuration. See “Apache Configuration” on page 77.

   b Enter the command:

   `/etc/init.d/starquality stop`

2 Run the installer application, *StarQuality.v3.0.en.bin*

3 Follow the installation promps and enter:

   - OS user of Oracle
   - ORACLE_HOME environment variable
   - StarQuality OS user name
   - Oracle host name [localhost]:
   - Oracle port
   - Oracle service name
   - Oracle SID
   - Oracle SYSTEM user password

   The system runs DB update scripts.

2.11 Uninstalling StarQuality

2.11.1 Uninstalling StarQuality from Windows

During the uninstallation the application asks whether it should delete the different components. If you want to keep a module which is dependent on another module, the application will not even ask to remove the other module. For example if you do not want to remove the *bash symbolic* link, it will not remove the Cygwin installation.

The only exception to this rule is the Oracle user: you can choose to keep it, but nevertheless the application will be uninstalled. The uninstaller only drops the Oracle user and the tablespaces.

To uninstall StarQuality from Windows:

1. Run the *UninstallStarQuality.exe* in the Cygwin root directory or select Start > Settings > Control Panel > Add or Remove Programs.
2. Fill in the SYSTEM password (oracle) and click **Uninstall**.

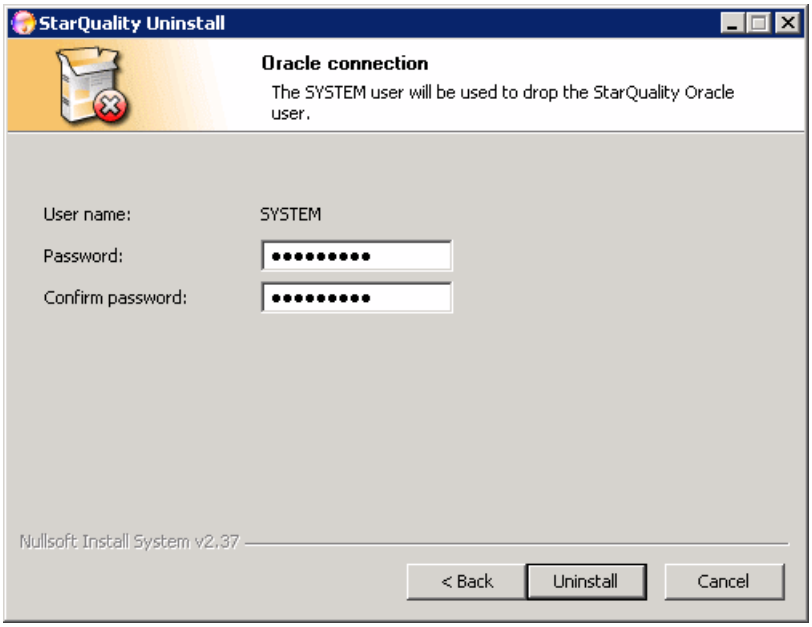


Figure 2-71: Uninstalling the Oracle User

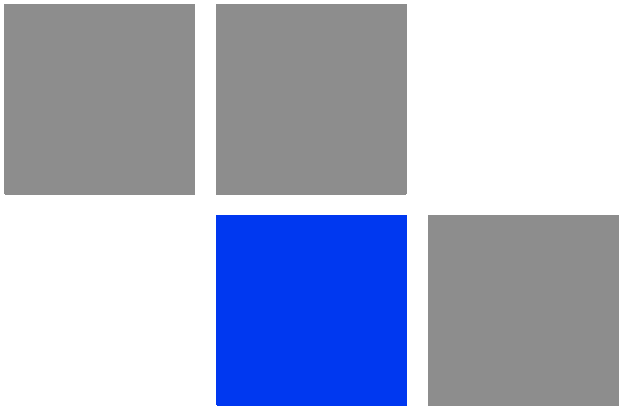
2.11.2 Uninstalling StarQuality from Solaris

To uninstall StarQuality from Solaris:

1. Log on to the StarQuality machine as *root*.
2. Stop any running StarQuality module:
   a. From Settings select Servers > Start/Stop/Status.
   b. Click **[stop all]** and wait untill all the entries of the list are red.
3. In a command window, run UninstallStarQuality from the StarQuality installation directory (default */opt/starquality*).
4. The application prompts for various confirmations. Follow the instructions and questions on the screen.

login: root
Password:
Last login: Mon May 11 16:18:25 from 172.30.105.112
Sun Microsystems Inc.   SunOS 5.10   Generic January 2005
You have new mail.
-bash-3.00# cd /opt/starquality/
-bash-3.00# ./UninstallStarQuality
INFO : Command line parameters:
INFO : Uninstaller started
INFO : LOG file: /tmp/starquality.install.log
INFO : Checking perl version
INFO : Found perl: /usr/bin/perl
INFO : Checking OS type
INFO : OS: Solaris_x86
INFO : Extracting files into the temp directory: /tmp/starquality
INFO : Done
INFO : Using the following values
INFO : OS user: starq
INFO : OS home directory: /opt/starquality
INFO : StarQuality directory: /opt/starquality
QUESTION : Are these values correct (Y/N) [Y]:
INFO : Searching for running StarQuality modules
QUESTION : Do you want to drop the Oracle user SQ (Y/N) [N]: y
QUESTION : The OS user of Oracle [oracle]: oracle
INFO : Found Oracle home: "/export/home/oracle/oracle/product/10.2.0/db_1"
QUESTION : ORACLE_HOME environment variable [/export/home/oracle/oracle/product/10.2.0/db_1]:
INFO : Checking the Oracle home /export/home/oracle/oracle/product/10.2.0/db_1
INFO : Oracle home /export/home/oracle/oracle/product/10.2.0/db_1 seems to be OK
INFO : Checking Oracle version
INFO : Found Oracle version 10
INFO : Detected 32-bit Oracle
QUESTION : Oracle SYSTEM user password []:
CONFIRM : Confirm the password:
INFO : If you drop the Oracle user SQ then your measurement data will be gone forever
QUESTION : Are you sure that you want to drop Oracle user SQ (Y/N) [N]: y
INFO : Dropping the Oracle user SQ, this could take several minutes
INFO :
User dropped.
INFO : Done
QUESTION : Do you want to drop the Oracle tablespace SQ_DATA (Y/N) [N]: y
INFO : Dropping the Oracle tablespace SQ_DATA, this could take several minutes
INFO :
Tablespace dropped.
INFO : Done
QUESTION : Do you want to drop the Oracle tablespace SQ_CONF (Y/N) [N]: y
INFO : Dropping the Oracle tablespace SQ_CONF, this could take several minutes
INFO :
Tablespace dropped.
INFO : Done
QUESTION : Do you want to restore the Apache configuration (Y/N) [N]: n
QUESTION : Do you want to delete the entire /opt/starquality directory (Y/N) [N]: y
INFO : Deleting the directory /opt/starquality
INFO : Deleting any S??starquality files in the /etc/rc*d directories
INFO : Deleting any K??starquality files in the /etc/rc*d directories
INFO : Deleting the file: /etc/init.d/starquality
INFO : Done
QUESTION : Do you want to delete the user starq (Y/N) [N]: y
INFO : Deleting the user starq
INFO : Deleting the group starq
INFO : Deleting the directory /opt/starquality
INFO : Done
-bash-3.00#

Figure 2-72: Uninstalling StarQuality from Solaris



Chapter 3

Getting Started

In this chapter:

- “Login” on page 108
- “The Structure of Interface Windows” on page 110
- “The Menu System” on page 111
- “Operations and Navigation in the Hierarchy” on page 115
- “General Display Options” on page 117
- “Editing Objects” on page 119

3.1 Login

10 working clients may simultaneously use the system. Using the system is possible with the following web browsers:

- Microsoft Internet Explorer
- Mozilla Firefox

To start a client session with StarQuality:

1 Open a web browser and go to http://<ip or hostname>/.

2 Enter User Name and Password. The default admin users credentials are:

```
admin
admin123
```

The StarQuality opening window is displayed for a few moments and then the main interface window opens (see Figure 3-2).

If Flash Player is not installed on the machine from which the client is opened, the following message appears:

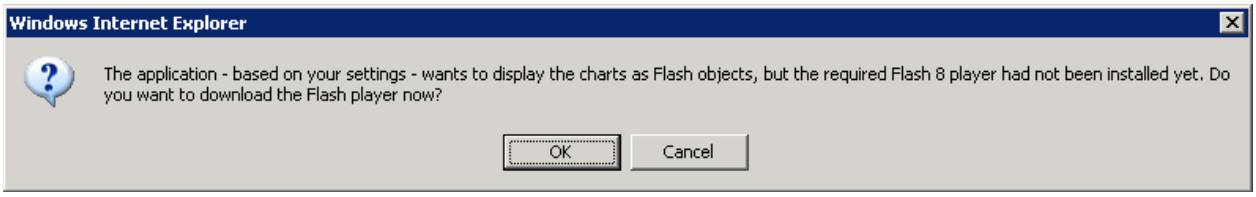

Windows Internet Explorer
The application - based on your settings - wants to display the charts as Flash objects, but the required Flash 8 player had not been installed yet. Do you want to download the Flash player now?
OK
Cancel

Figure 3-1: Flash Player Message Window

You can install Flash to display data with Flash functionality. If you do not install Flash, the data is displayed without Flash features.

3 You can proceed with discovering the network (see "Network Discovery" on page 120), modify settings or start monitoring the equipment.

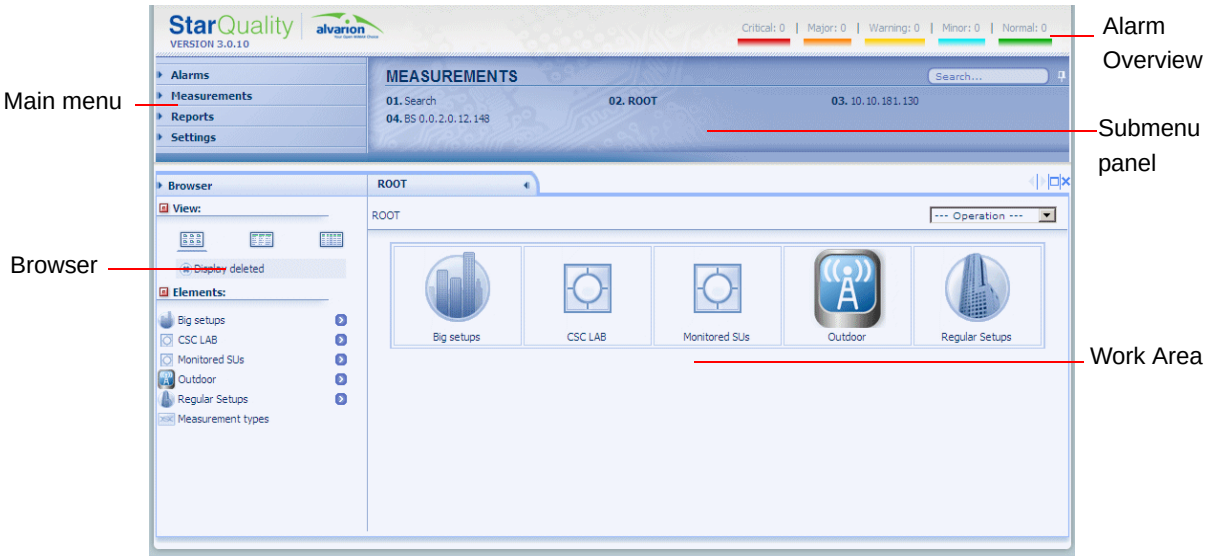


Figure 3-2: The StarQuality User Interface

3.2 The Structure of Interface Windows

The interface of the StarQuality application divides the browser window into several panels (see Figure 3-2):

- **Alarm overview bar** - displays current alarms, grouped by their severity level. This also acts as a shortcut to the alarm screens. The application displays only alarms that the user has permissions to view. If access to alarms is unavailable, the bar is completely missing.

- **The main menu** - contains the main operation tasks of the system: Alarms, Measurements, Reports, and Settings. Selecting each item on this menu opens various submenus and groups displayed in the submenu panel and in the browser. For detailed structure, refer to “The Menu System” on page 111.

- **Submenu panel** - the submenus under the selected menu item are displayed on the adjoining right hand side panel. This panel can be scrolled (up and down) using the arrows on its right edge. The submenu structure displayed here can be customized in order to accelerate the execution of frequently repeated navigation steps.

- **The browser** - located on the bottom left side of the user interface. The browser can contain further submenu items and special menu groups based on the chosen menu items in the upper menu system.

  Non-administrator users can only view those alarms/pieces of equipment/sites for which they have permissions. Refer to “User Types and Their Settings” on page 6.

  The user name and type appears in the title of the web browser window.

3.3 The Menu System

The following sections describe the main menu, the submenus under it and the menu items and groups appearing in the browser. These items vary depending on the selected item in the main menu. For example: Time Span is displayed only when selecting Measurements or Alarms in the main menu (see Figure 3-3.

3.3.1 Measurements

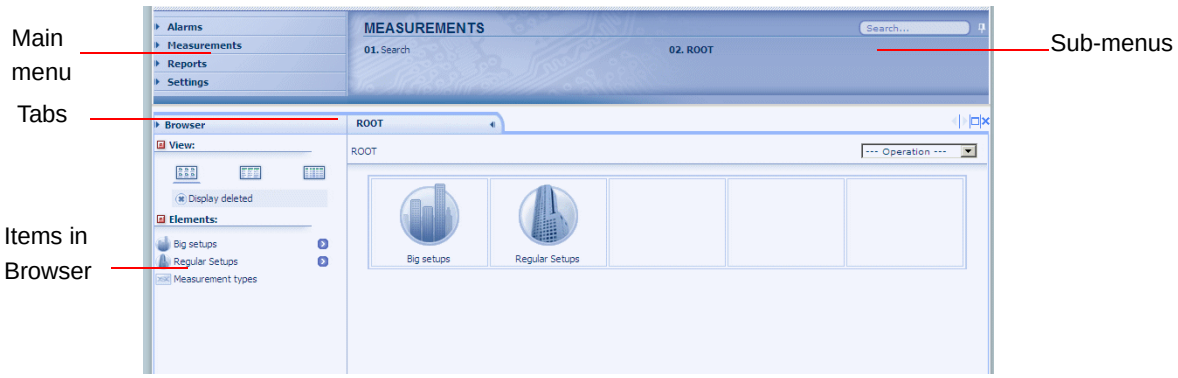


Figure 3-3: Example of Menus, Submenu Panel and Browser (in Measurements)

- Items in the submenu panel:
  - **Search** for sites, equipments, measurements and charts on the basis of sites/equipment names (see "Searching Measurements" on page 158)
  - **Root** - root directory navigation startpoint
  - If defined, public and private menu items for viewing the measurements under the chosen menu item

- Items in the Browser:
  - **View** menu group: Selecting the mode of display for the measurements (see "Measurements Display Options" on page 151)
  - **Time Span**: Selecting the time range to display measurements:
    - from time/date to time/date
    - day/week/month/year
    - real time view - auto refresh view
  - **Chart Settings** - displaying the measurement values
  - **Elements** menu group**:** This menu contains a list of the sites, equipments and measurement types. The root of the hierarchy is determined by the originally selected menu item (see "Viewing Measurement Data" on page 155).
    - Element name, e.g. <FDD Network> - If the list contains too many elements, they are grouped by the system, using links pointing to the sub-lists.
    - Measurement Types - for filtering the measurements by their types

3.3.2 Alarms

- Items in the submenu panel:
  - **Root** - root directory navigation startpoint
  - If defined, public and private menu items for viewing the alarms under the chosen menu item

- Items in the Browser:
  - **Time Span**: Selecting the time range to display alarms (see “Viewing Alarms by Time Span” on page 186):
    - from time/date to time/date
    - day/week/month/year
    - real time view - auto refresh view
  - **View** menu group: Choosing the display mode for the alarms (see “Alarm View Options” on page 186)
  - **Filters** menu group: Filtering of the alarms to be displayed (see “Filtering Alarms” on page 190)

3.3.3 Reports

- Items in the submenu panel:
  - On-demand report - setting a new report (see “On-Demand Reports” on page 202)
  - Bulk export wizard - exporting reports to Excel (see “Bulk Export Wizard - Exporting Data to XLS Files” on page 210)
  - Direct links to the built-in reports (see “Built-in Reports” on page 195)
- Items in the Browser:
  - **Calendar:** The reports are displayed with respect to the time interval selected in the calendar.
  - **Settings**: appear only when displaying reports, include:
    - Type
    - Show date column

    Refer to “Setting the Report Range and Display” on page 207

3.3.4 Settings

For each item in the submenu panel, different items appear in the Browser. For non-administrator users, the submenus used to make changes are not displayed, and the other submenus are displayed selectively based on the access rights of the user.

- **Search:** Searching the configured objects based on sites/equipment names [see “Search (Admin only)” on page 221).
- **Site and equipment configuration:** Configuring basic and virtual sites and equipment objects
- **Thresholds (admin only):** Setting alarm threshold parameters (see “Setting Alarm Thresholds” on page 165).
- **Scheduled configurations (admin only):** Automatically scheduled configurations that the Job queue module could not yet execute successfully (see “Scheduled Configuration” on page 142)
- **Reports (admin only)**: Setting and viewing system reports (see “Reports” on page 193
- **Customization:** editing of “public” objects refers to the administrator users, while editing of “private” objects refers to the rest of the users (“Customization” on page 233):
- **Templates (admin only)**: Editing various system templates (see “Creating and Editing Threshold Templates” on page 168)
- **Servers (admin only)** (see “Server Configuration and Management (Admin only)” on page 246):
- **Audit trail (admin only):** Displaying the individual configuration modifications (see “Audit Trail” on page 258)
- **User**: Managing user settings (see “User Administration (Admin only)” on page 261)

3.4 Operations and Navigation in the Hierarchy

In Alarms, Measurements and Reports pages (and also under the Settings > Site and Equipment Configuration submenu) there are three elements at the top of the page. These fields are always visible (even if the page is scrolled):

- The **Operations** pull down menu (located at the top-right), contains different options depending on the current object and menu item (see Figure 3-4):
  - » Fast navigation between the menu items while keeping the actual location within the hierarchy; for example, immediate opening of the measurement charts form the equipment configuration.
  - » A Print option for Alarms, Measurements and Reports, because this is the only possible way to print the full content of the main display area (the basic print function of the browser is not suitable for this)
  - » For Measurements, an option to save the current object as a menu item

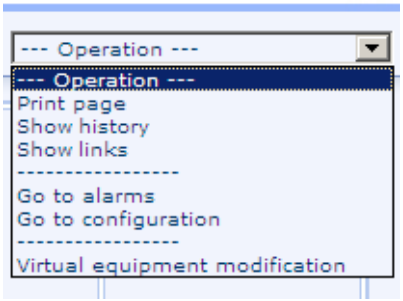


Figure 3-4: Example of Operations pull down menu

- A path (at the top-left) showing the current location within the hierarchy. It is always possible to click on the elements of this list, except for the last one, and return to a higher hierarchy level.

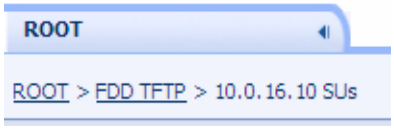


Figure 3-5: Hierarchy Path

If during the navigation you access an equipment through one of its virtual sites then after any equipment modification you cannot get back to that point in the virtual hierarchy, because the application will modify the current location according to the normal hierarchy, i.e. it will show the equipment under its parent site.

Notice that by using the fast navigation between the menu items (see the above bullet), the current location within the hierarchy might change: although the page will show the selected object, the path shown to the root object might be incorrect.

3.5 General Display Options

3.5.1 Scrolling or Hiding the Submenu Items

- If the name of a menu item is too long to display, it is abbreviated. To view the entire text as a tooltip, move the mouse pointer over it.
- To hide the entire menu system, click on the icon at the top-right corner of the panel (Figure 3-6). In this case the component can only be viewed if the mouse pointer is placed above it.
- To cancel the automatic hiding of the panel, click on the hiding icon again.

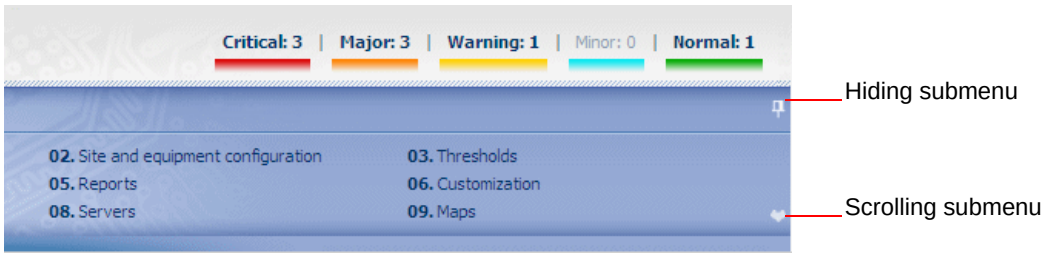


Figure 3-6: Scrolling and Hiding the Submenu

3.5.2 Using the Display Tabs

You can work with several open pages at the same time. The current page or pages currently in use are displayed as tabs. You navigate the opened pages with the tabs on the top of the pages. The selected page always comes up in the front. The tabs can also be scrolled horizontally.

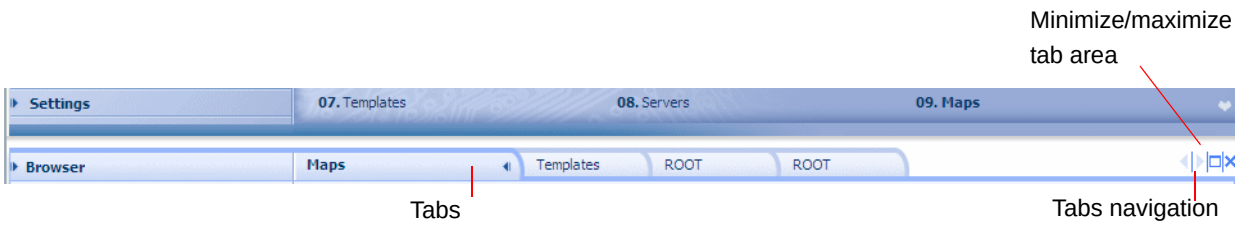


Figure 3-7: Navigation Tabs

When a page is put in the background, the browser window stores its content that is subsequently restored when the user chooses to display that page again.

If you select a menu item, the requested page is displayed instead of the current page. However, it is also possible to load the new page in a new tab. This is the default option when using the Alarms fast menu, while in the configurable menus you can select whether the new page should be displayed in a new or in an already existing tab.

To set the tab display options:

Use the following options to set the tabs display:

Table 3-1: Setting the Tab Display Options

To	Do this:
Select the tab display mode	Right-click on the menu items and select either “Open in a new tab” or “Open in tab: <already existing_tab_name>”.
Rename the tab	Click the tab title, type the name and press Enter.
Maximize/minimize the page to entire window	Use the icon at the top-right corner (see Figure 3-7)

3.6 Editing Objects

This section explains the general editing principles of the system. The various possibilities of editing different kinds of objects are discussed in detail in the corresponding sections.

The list of editable objects is displayed in a table that, with the exception of the Site-equipment-measurement Configuration page, contains the most important attributes of the objects.

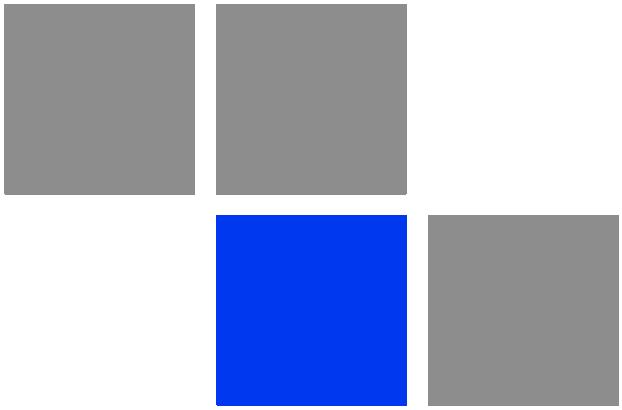
In the Settings menu you can edit the various objects of the system.

To edit objects:

Use one of the following options, when available:

Table 3-2: Editing Objects

To	Do this:	Comments
Delete an object (only if it has no sub-elements)	Click **[del]**	The system always prompts to confirm the action before it is executed.
Modify an oblect	Click **[edit]** and modify the parameters	Click **OK** or Cancel
Create a new simple object	Click **[add new]**	
Create objects based on a template	Click **[from template]**	
Create objects based on another object	Click **[copy from]**	
Perform other editing operations	Use the pull down menu available on the screen	Applicable in case of normal and virtual sites.



Chapter 4

Network Discovery

In this chapter:

- "Overview" on page 122
- "Discovery of WiMAX Devices" on page 125
- "Discovery of Equipment under a Server-Health Site" on page 130
- "Scheduled Configuration" on page 142

4.1 Overview

At first login, the system contains only a ROOT site. You build your new network (sites) under the ROOT to be able to start monitoring your equipment performance using the StarQuality.

Mapping the network in StarQuality can be done using various structures, such as by geographical locations, by topics, etc. This section explains the creation of a a WiMAX network and all the BTSs under it, and creating a utility network.

Following are available site types:

- WiMAX-equipment
  - WiMAX FDD SNMP - FDD versions 3.5/3.6, SNMP data collection. Up to 10 SUs per BTS can be measured
  - WiMAX FDD TFTP - FDD version 3.7, TFTP data collection
  - WiMAX TDD - TDD versions 4.5 and later, TFTP data collection
  - 4Motion - version 2.5M and 3.0
  - BreezeACCESS VL - version 6.0. Up to 10 SUs per BTS can be measured
  - Extreme - version 1.5
- Server Health
  - AlvariSTAR Version 4.0 and later
  - Oracle
  - UNIX

The measurements can be viewed not less than 30 minutes following the initial collection for each device.

For more information on configuration, refer to Chapter 9 - “General Setting Options” on page 216.

To create a WiMAX network site under ROOT:

1 From Settings select **Site and Equipment Configuration**.

2 From the Creation drop-down menu select **Create New Site**. Fill in the site name (free text), and its description (optional).

3 Select a corresponding icon.

4 Select a Server Group (see Figure 4-1):

- For FDD 3.5/3.6 network - WiMAX FDD
- For FDD 3.7 network - WiMAX FDD TFTP
- For TDD network - WiMAX TDD
- For 4Motion (ver.2.5) network - WiMAX 4Motion
- For Extreme network - WiMAX Extreme
- For VL network - WiMAX VL

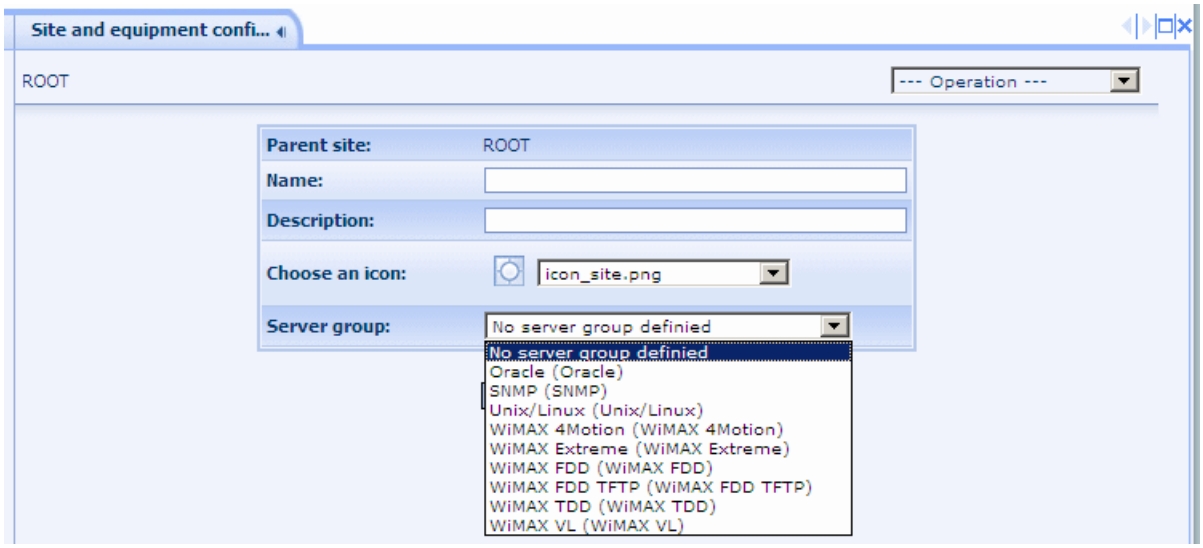


Figure 4-1: Creating a New Site - Server Group Selection

5 Click **OK**; The network site is created under the ROOT.

6 Proceed with discovery of devices according to the site type you created: refer to "Discovery of WiMAX Devices" on page 125.

To create a Server Health site under ROOT:

1 From Settings select **Site and Equipment Configuration**.

2 From the Creation drop-down menu select **Create New Site**. Fill in the site name (free text), and its description (optional).

3 Select a corresponding icon.

4 Select the **SNMP Server Group** (see Figure 4-1).

5 Click **OK**; The site is created under the ROOT.

6 Proceed with discovery of devices according to the site type you created: refer to "Discovery of Equipment under a Server-Health Site" on page 130

4.2 Discovery of WiMAX Devices

This section describes how to add BTSs to the network. Data collection is automatically activated after discovery, except for equipments collected by SNMP, for which data collection has to be activated manually.

To perform actual discovery:

1. From Settings select **Site and Equipment Configuration**.
2. Enter the site matching the equipment type to be discovered, by clicking its icon.
3. From the Creation drop down menu select **Add Equipments** (plural) **from Template**.
4. Select the template upon which to base the equipment setup:
   - For FDD ver3.5/3.6 - WiMAX FDD SNMP
   - For FDD ver3.7 - WiMAX FDD TFTP
   - For TDD - TDD
   - For 4Motion - WiMAX 4Motion
   - For VL - WiMAX VL
   - For Extreme - WiMAX Extreme

   A basic setup template page is displayed.

NOTE

Each discovery can include a single equipment type.

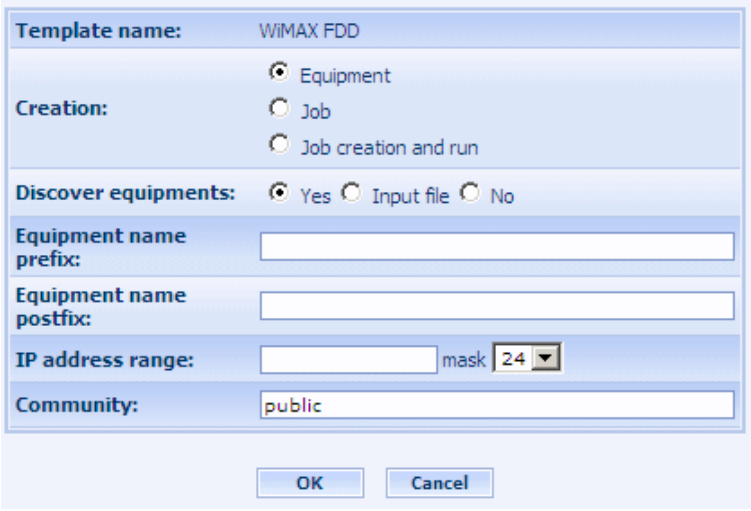


Figure 4-2: Creating New Equipments from Template - WiMAX FDD

5 In the Creation section make sure the Equipment option is selected.

6 In the Discover Equipments field select either:

» No - to add equipments manually (see Step 8)

» Input File - to upload a text file (See Step 9)

The Yes option is not applicable for WiMAX equipment.

7 In the Community section, override the Read community setting with the relevant one for your network.

8 If you selected No:

a Click **OK** ; the system returns to the main network list.

b Click **[Add new]** to add as many equipments as required.

c In each line enter: BTS name (free text up to 46 characters), description and IP address. Name and IP address are mandatory.

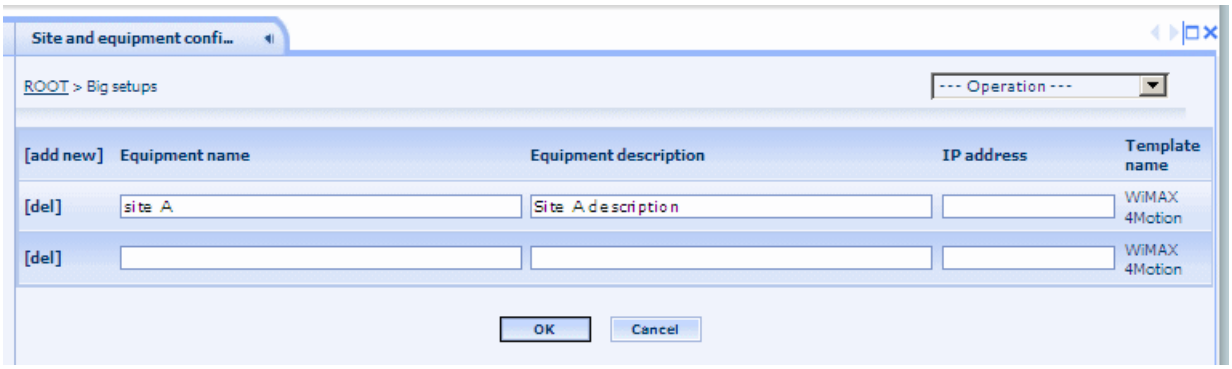


Figure 4-3: Adding Sites manually

NOTE

Searching and displaying of devices in StarQuality is done by names only, therefore it is advised to keep a systematic naming convention, for example, it is recommended to name each device by its IP.

9 If you selected Input File:

- **a** Prepare a text file, in which each line signifies a BTS. Each line entry includes three columns in the following order: equipment name, equipment description (optional) and IP address. Allowed delimiters: semicolon (;) or tab. Save it as a .txt type file.
- **b** In the StarQuality application click **Browse** to select this file.
- **c** Click **OK**; the system returns to the main network list, loaded with device data from the uploaded file. You can edit this list as required.

10 Click **OK**; the system searches and discovers each existing and online BTS. For each discovered BTS a success message appears; For each unsuccessful discovery an error massage is displayed and the system continues to the next device.

11 When the discovery is complete, click **Back** to return to the network site.

12 Verify that all the equipments are not colored red, which means that their data is being collected.

13 Verify that for each BTS, a matching site has been created, named as the BTS with the postfix “SUs” (i.e, <btsname SUs>).

14 In case of BTS SNMP collection (FDD 3.5/3.6 or BreezeACCESS VL), this SU site is colored red, which means that no SU under it are being collected yet. In this case, activate Data Collection for up to 10 SUs as described in Section 4.2.1 below.

4.2.1 Activation/Deactivation of Data Collection

When you create a site, data collection is by default activated for all AUs and SUs (except for SNMP - FDD ver3.5/3.6 and BreezeACCESS VL SUs).

To activate or deactivate data collection for any equipment type:

1 Click the site icon to enter the site.

2 For each equipment repeat the following:

a Click **[edit]** next to the equipment you want to activate. The following window is displayed (measurement types themselves may vary according to the specific equipment: SU, BTS, Server Health element):

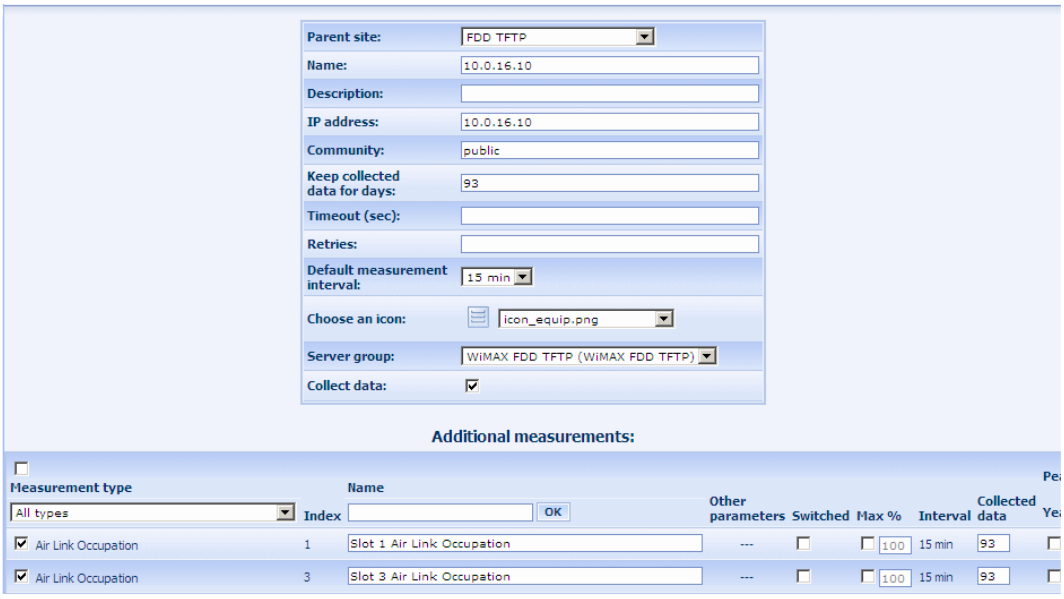


Figure 4-4: Activating Data Collection

b Select or deselect the Collect Data checkbox at the bottom of the upper table.

c Select or deselect the measurements you want to activte/deactivate in the lower table .

d Click **OK**.

e Go back one level in the navigation path and verify that the equipment line line is no longer red (acivated) or is red if deactivated (Figure 4-5).

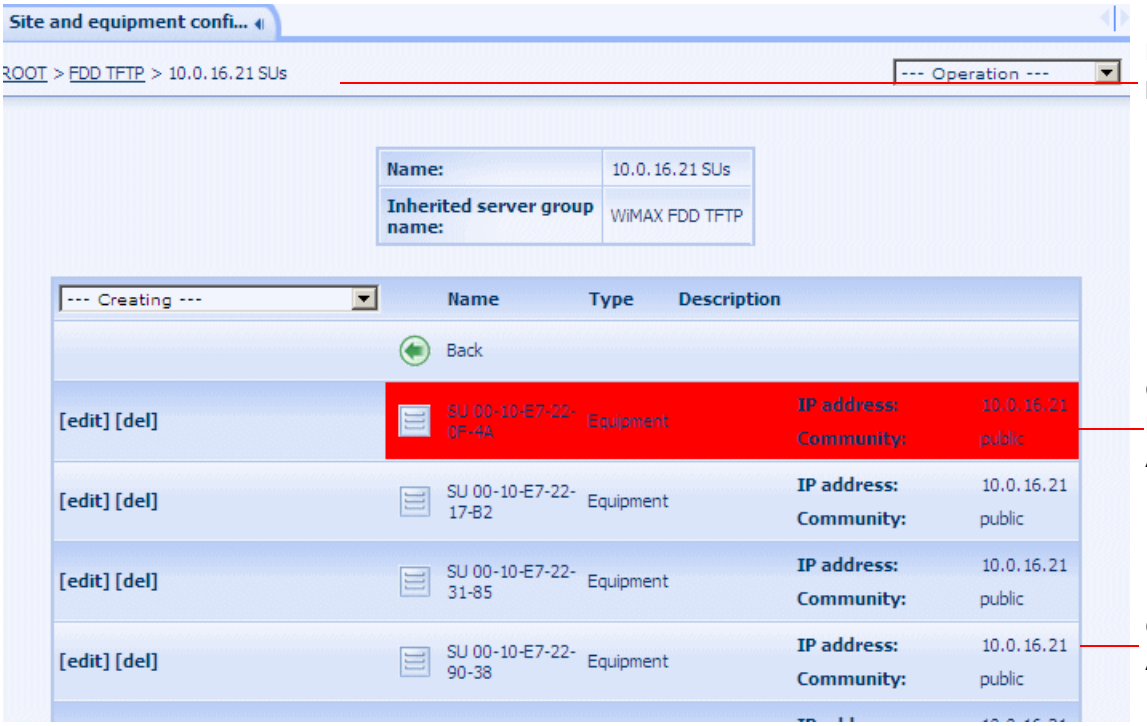


Figure 4-5: Data Collection Status

4.3 Discovery of Equipment under a Server-Health Site

This section describes how to add equipment related to server health to the StarQuality and initiate the data collection from them. For these equipment types, only a single device is discovered each time; that is, there is no multiple discovery.

You can use a template or create new equipment from scratch. The procedures in this section describe the recommended way of creating equipment from templates.

For more information refer to “Site and Equipment Configuration” on page 222, and “Discovery of WiMAX Devices” on page 125.

To add AlvariSTAR server:

1. Make sure the following prerequisites are available:
   - Setup and configuration:
     - Network connection between StarQuality and AlvariSTAR machines
     - AlvariSTAR ver4.0 and later
   - Information:
     - AlvariSTAR machine IP address
     - Read community of AlvariSTAR SNMP server (if not changed, default is: “public”)
2. From Settings select Site and Equipment Configuration.
3. Click the **Server Health** icon to enter its site.
4. From the Creation drop down menu select Add Equipment from Template.
5. Select the template upon which to base the equipment setup: AlvariSTAR.
6. Click **OK**. A basic setup template page is displayed.

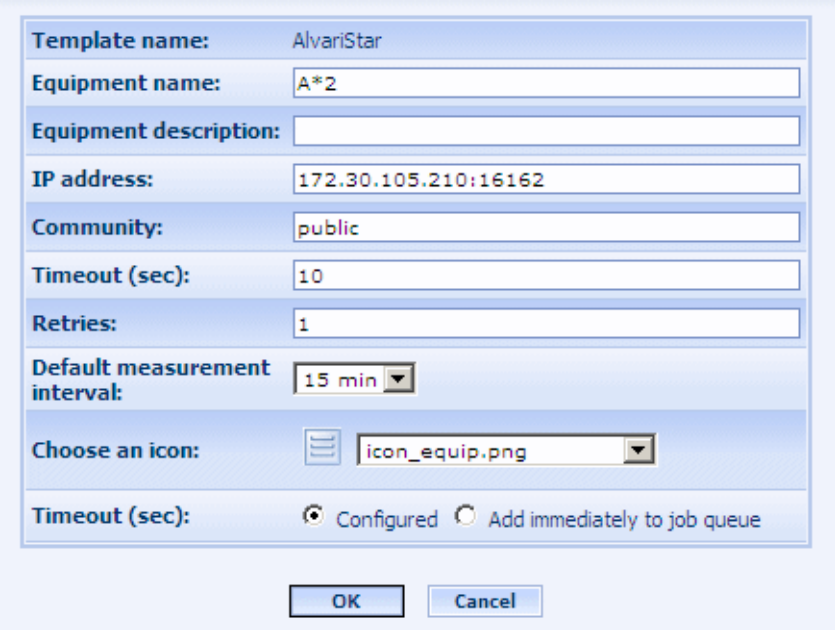


Figure 4-6: Creating New Equipment - AlvariSTAR

7 Fill in the required information (for parameter information and description refer to "Discovery of WiMAX Devices" on page 125):

- Name and description - free text
- IP address: <ip address>:<16162>
- Community: public
- Leave all other fields with their default values.

8 Click **OK**; Discovery is running and can take up a few minutes. The following window is displayed. The green field means that collection is activated by default.

Figure 4-7: Data Collection Active

9 If you wish to edit the specific counters collected, select Modify Equipment from the Operations drop-down menu.

10 choose specific measurements or all measurements by selecting the corresponding check-boxes.

11 Scroll down and click **OK** to implement changes.

To add an Oracle database server:

1. Make sure the following prerequisites are available:
   - Setup and configuration:
     - Network connection between StarQuality and Oracle machines
   - Information:
     - Oracle TNS name - in case StarQuality and Oracle are on the same machine: Oracle server TNS; in case StarQuality and Oracle are on separate machines: Oracle client TNS (TNS name is defined in the file *tnsnames.ora* placed in the directory: ORACLE_HOME\NETWORK\ADMIN
     - Password of Oracle SYSTEM user
2. From Settings select Site and Equipment Configuration.
3. Click the **Server Health** icon to enter its site.
4. From the Creation drop-down menu select Add Equipment from Template.
5. Select the template upon which to base the equipment setup: Default Oracle.
6. Click **OK**. A basic setup template page is displayed.

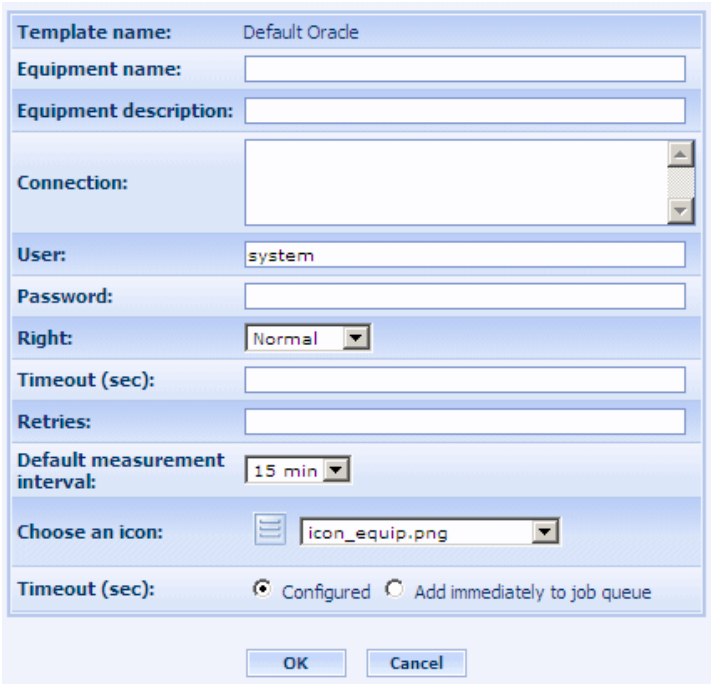


Figure 4-8: Default Oracle Template

7 Fill in the required information (for parameter information and description refer to "Discovery of WiMAX Devices" on page 125):

- Name and description - free text
- Connection: <TNS name>
- User: system
- Password: SYSTEM password
- Right: SYSDBA/SYSOPER/Normal, according to security preferences
- Leave all other fields with their default values

8 Click **OK**; Discovery is running and can take up a few minutes. The following window is displayed. Red fields mean that collection is not activated by default.

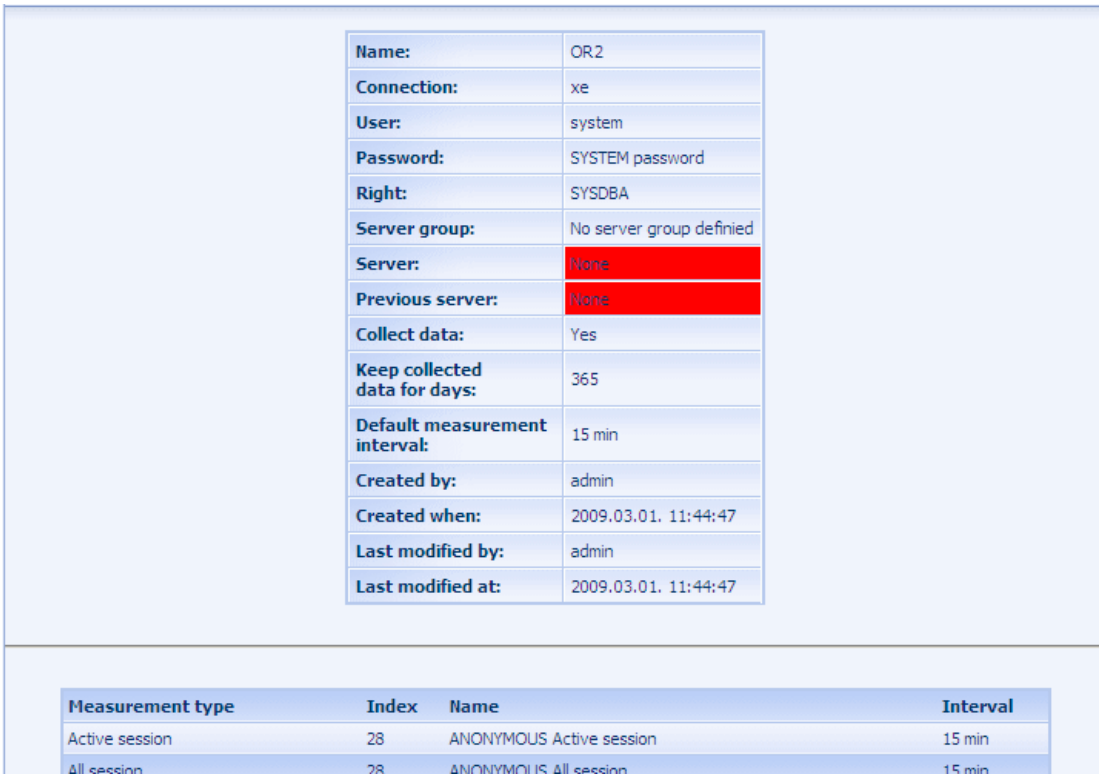


Figure 4-9: Network Discovery Results (Oracle)

9 To start collecting select from the Operations drop-down menu Modify Equipment. The following window is displayed.

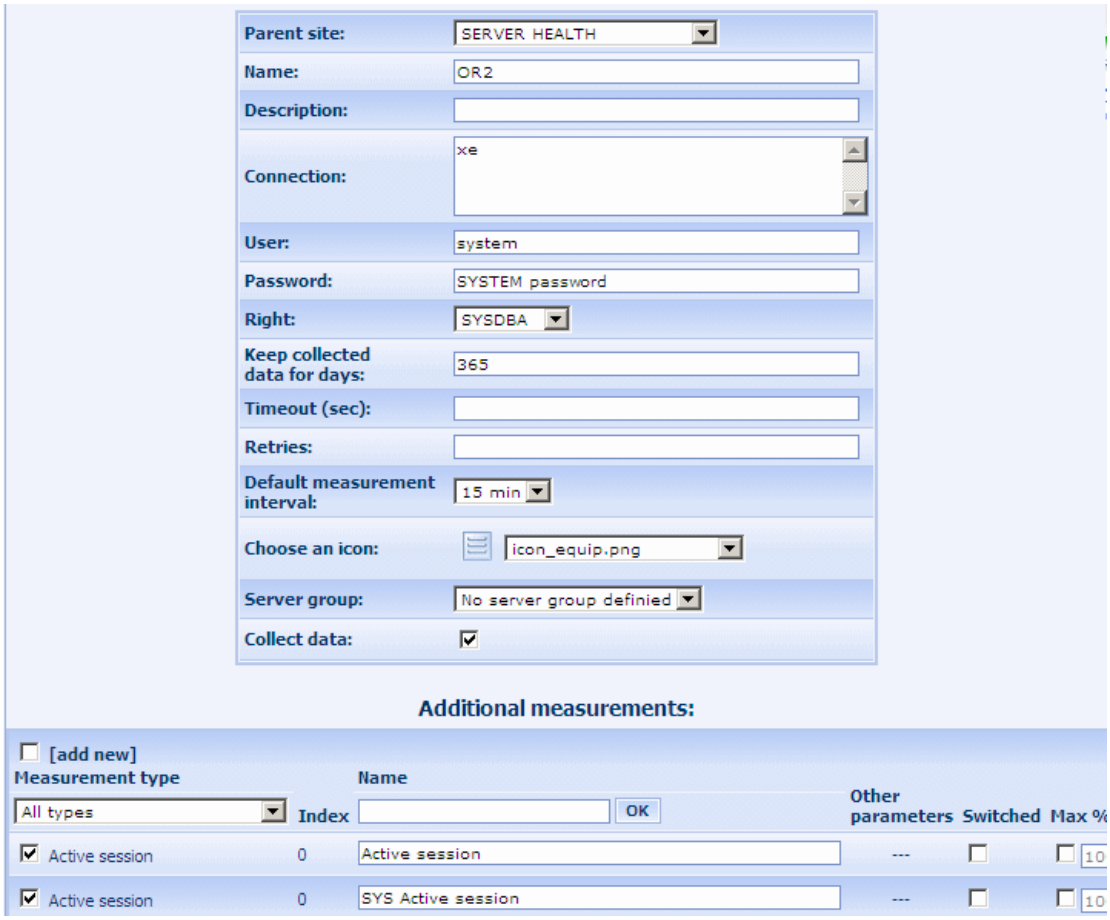
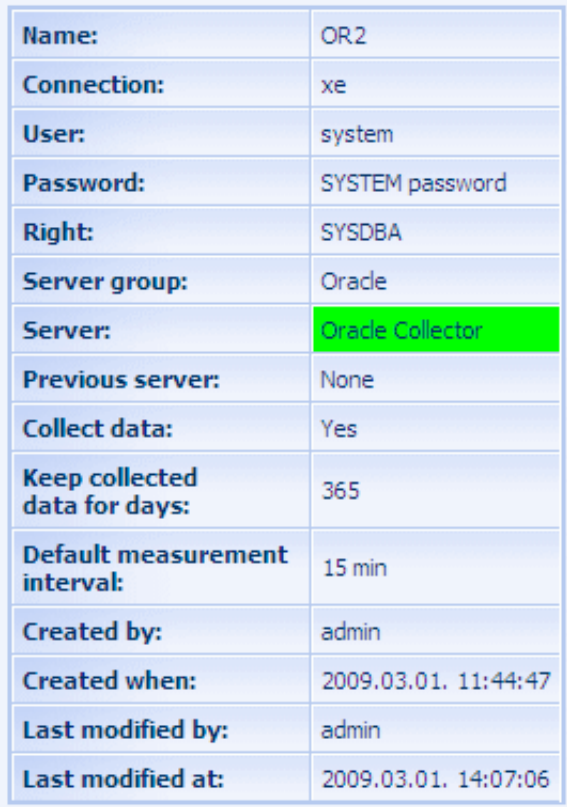


Figure 4-10: Activating Data Collection (Oracle)

10 Change Server Group to Oracle, and choose specific measurements or all measurements by selecting the corresponding check-boxes.

11 Scroll down and click **OK** to implement changes. The Server field turns green which indicates that collection is active.



Name:	OR2
Connection:	xe
User:	system
Password:	SYSTEM password
Right:	SYSDBA
Server group:	Oracle
Server:	Oracle Collector
Previous server:	None
Collect data:	Yes
Keep collected data for days:	365
Default measurement interval:	15 min
Created by:	admin
Created when:	2009.03.01. 11:44:47
Last modified by:	admin
Last modified at:	2009.03.01. 14:07:06

Figure 4-11: Data Collection Active (Oracle)

To add equipment under the UNIX/Linux site:

1 Make sure the following prerequisites are available:

- Setup and configuration:
  - Network connection between StarQuality and UNIX machines
- Information:
  - IP address of UNIX machine
  - UNIX user name and password. The prompt for the user used for discovery must have the following pattern: end with a space or have a >, #, %, or $ character followed by a space.

2 From Settings select Site and Equipment Configuration.

3 Click the **Server Health** icon to enter its site.

4 From the Creation drop down menu select Add Equipment from Template.

5 Select the template upon which to base the equipment setup: Default Unix/Linux.

6 Click **OK**. A basic setup template page is displayed.

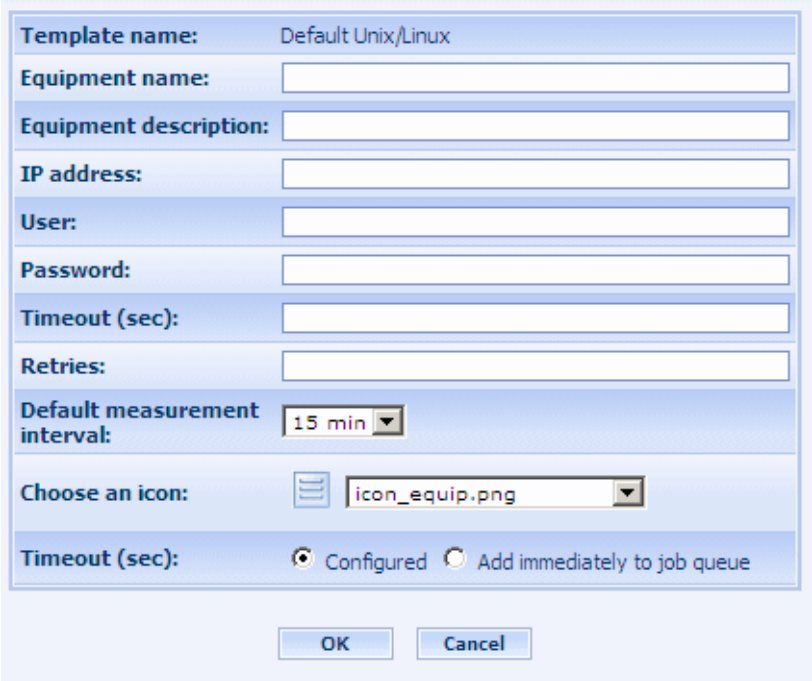
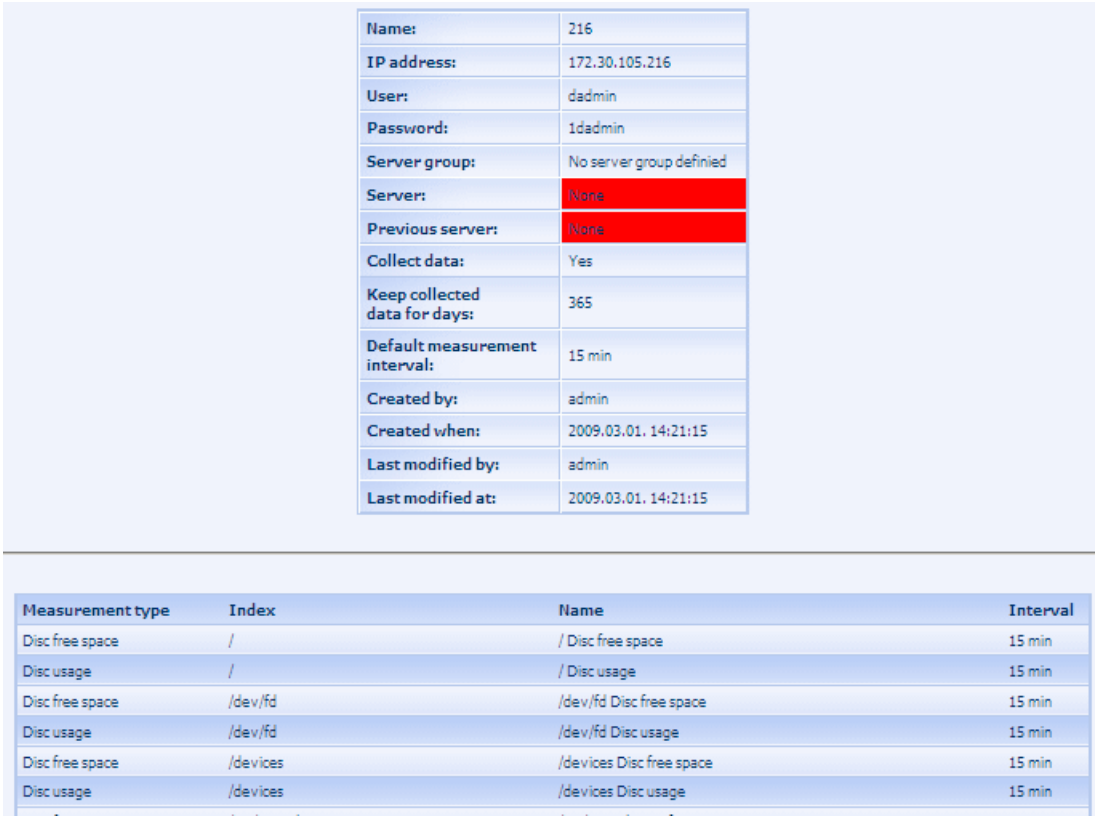


Figure 4-12: Default Unix/Linux Template

7 Fill in the required information (for parameter information and description refer to "Discovery of WiMAX Devices" on page 125):

- Name and description - free text
- IP address: <ip address>
- User: <root>
- Password: <root password>
- Leave all other fields with their default values

8 Click **OK**; Discovery is running and can take up a few minutes. The following window is displayed. Red fields indicate that collection is not activated by default.



Name:	216
IP address:	172.30.105.216
User:	dadmin
Password:	1dadmin
Server group:	No server group definied
Server:	None
Previous server:	None
Collect data:	Yes
Keep collected data for days:	365
Default measurement interval:	15 min
Created by:	admin
Created when:	2009.03.01. 14:21:15
Last modified by:	admin
Last modified at:	2009.03.01. 14:21:15

Measurement type	Index	Name	Interval
Disc free space	/	/ Disc free space	15 min
Disc usage	/	/ Disc usage	15 min
Disc free space	/dev/fd	/dev/fd Disc free space	15 min
Disc usage	/dev/fd	/dev/fd Disc usage	15 min
Disc free space	/devices	/devices Disc free space	15 min
Disc usage	/devices	/devices Disc usage	15 min

Figure 4-13: Network Discovery Results (Unix/Linux))

9 To start collecting select from the Operations drop-down menu Modify Equipment. The following window is displayed.

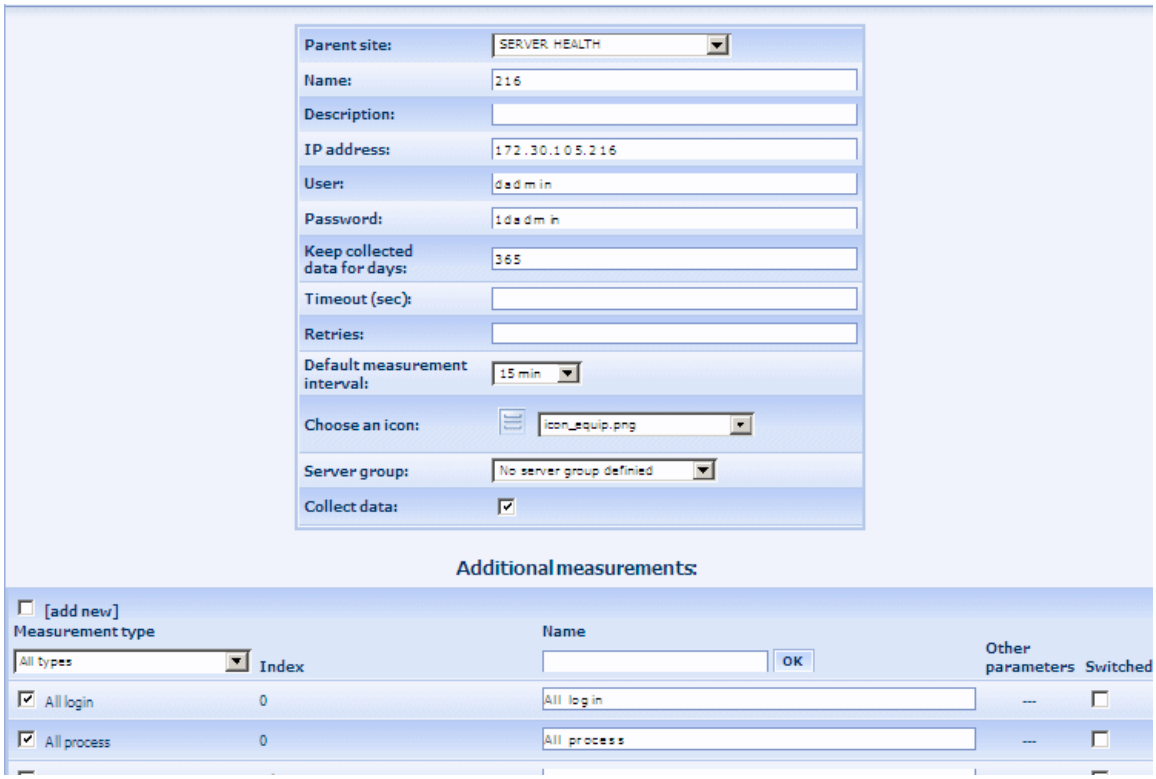


Figure 4-14: Activating Data Collection (UNIX)

10 Change Server Group to Unix/Linux, and choose specific measurements or all measurements by selecting the corresponding check-boxes.

11 Scroll down and click **OK** to implement changes. The Server field turns green which implies that collection is active.

Name:	216
IP address:	172.30.105.216
User:	dadmin
Password:	1dadmin
Server group:	Unix/Linux
Server:	Unix/Linux Collector
Previous server:	None
Collect data:	Yes
Keep collected data for days:	365
Default measurement interval:	15 min
Created by:	admin
Created when:	2009.03.01. 14:21:15
Last modified by:	admin
Last modified at:	2009.03.01. 14:31:50

Figure 4-15: Data Collection Active (UNIX)

4.4 Scheduled Configuration

In case the equipment is not available when you edit the configuration (discovery), you can display the configuration details using the Scheduled Configuration page from Settings.

Restricted administrators can view or edit a scheduled configuration only if they have permission to its parent site.

To set the equipment for scheduled discovery:

1 Follow the steps in "To perform actual discovery:" on page 125, with the following change:

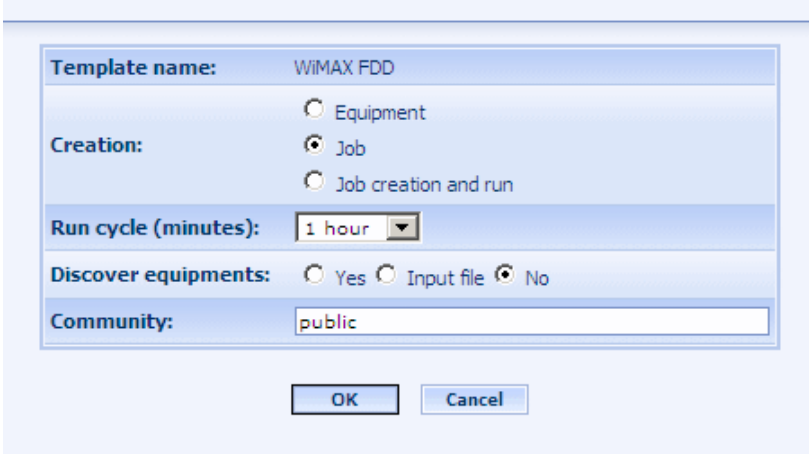


Figure 4-16: Setting Discovery to a Schedule

2 In the Creation section select either:

- Job - the system creates scheduled jobs based on the parameters but does not run them
- Job creation and run - the system creates scheduled jobs based on the parameters and runs them immediately. If the equipment creation for a job is not successful, it is not deleted, and therefore the Job queue server component can try it later.

3 Define the Run Cycle.

4 In the Discover Equipments field select No - to add equipments manually.

5 Define the Community.

6 Click **OK**.

To use the Scheduled Configuration:

1 From Settings select Scheduled Configuration; The Scheduled Configuration table is displayed, with the following columns:

Table 4-1: Scheduled Configuration

Item	Description
Links	**[edit]** - the entry can be edited **[del]** - the entry can be deleted [now] - the system is trying to instantiate the configuration belonging to the entry immediately and does not wait for the next cycle
Site name	The equipment will be placed to this site
Template name	The system will instantiate the equipment using this template
Equipment name	The same name as in the manual creation of the equipment
Equipment description	The same as in the manual creation of the equipment
IP address	equipment IP address
Community	Equipment read SNMP community
Keep data for days	The value of the appropriate equipment parameter
Default interval	The value of the appropriate equipment parameter
Next run	The next time the system will try to configure the the equipment
Run cycle (minutes)	In case of an unsuccessful attempt, the time period (in minutes) before retrying

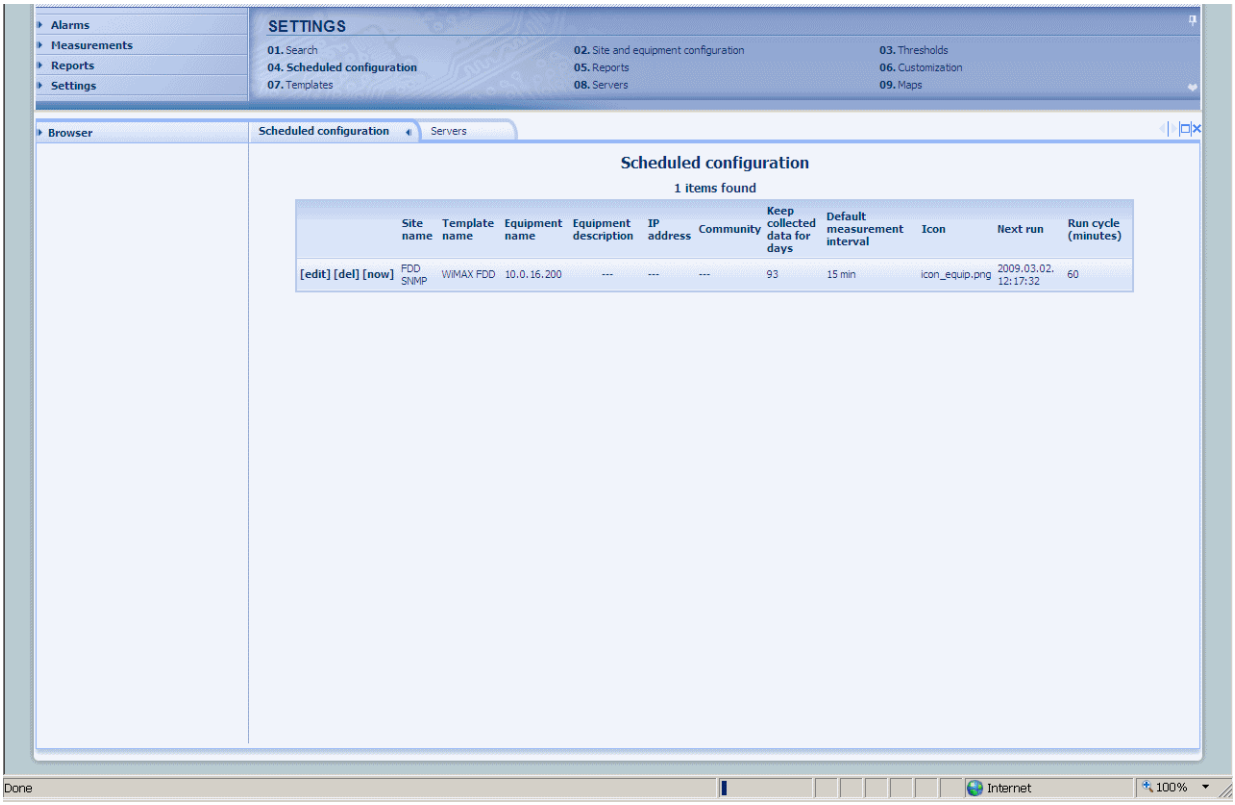


Figure 4-17: Scheduled Configuration

2 Do one if the following:

» To modify the task parameters, click **[edit]**; The same parameters (except for the retrying time) can be modified as at template based creation.

The IP address, SNMP Community and SNMP version fields are also displayed.

» To delete a scheduled task, click **[del]**

» To try and execute the entry immediately and not wait for the next run, click **[now]**.

Chapter 5

Viewing Measurements

In this chapter:

- "Introduction" on page 147
- "WiMAX Equipment Measurements" on page 149
- "Measurements Browsing Options" on page 150
- "Measurements Display Options" on page 151
- "Viewing Measurement Data" on page 155
- "Searching Measurements" on page 158
- "Saving Items as A Submenu" on page 161
- "Setting Trendlines to Graphs" on page 162

5.1 Introduction

Viewing measurements is available using a configurable quick menu at the top panel for displaying and navigation. New elements can be added to the page using the Settings > Customization menu (see “Customization” on page 233).

The Browser is also available for displaying, navigation and filtering in the site-equipment-measurement hierarchy, and it shows the measurements according to the measurement type.

Only those objects (sites, equipments, or measurements) for which the user has permissions are accessible.

The figure below shows the Browser and the Icon view of the selected hierarchy level (Root).

Figure 5-1: The Measurements Main Menu Item with the Browser and the Icon View

The structure of sites is illustrated in the following figure:

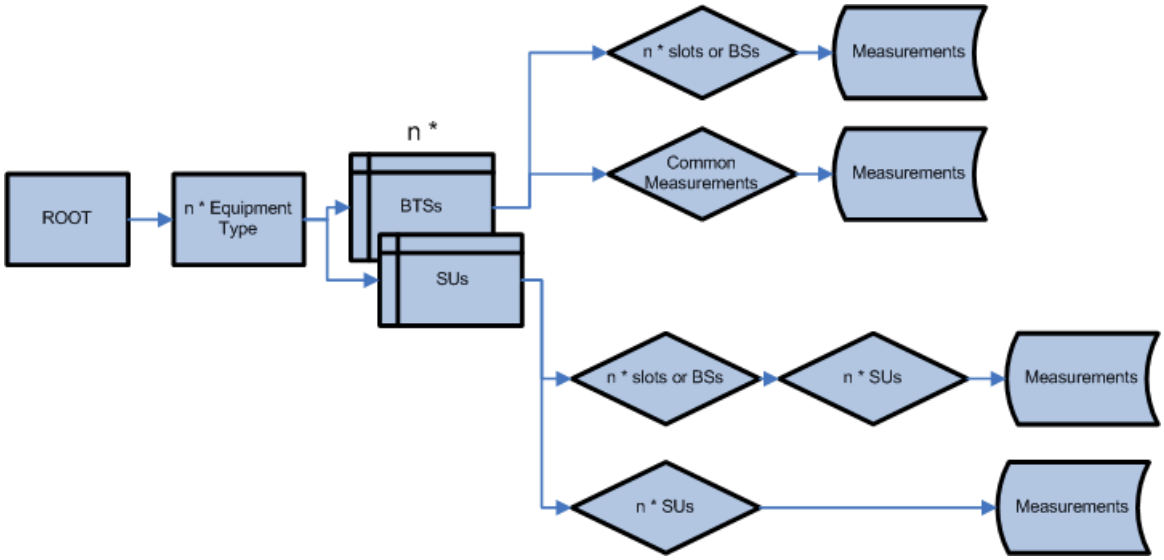


Figure 5-2: Hierarchy of Sites

5.2 WiMAX Equipment Measurements

KPIs (Key Performance Indicators) exist for three types of entities:

- Slot (also referred to as AU, sector, BS)
- SU (also referred to as MS, CPE)
- NPU (also referred to as BTS, in “common measurements”)

For specific device information refer to Chapter 11.

5.3 Measurements Browsing Options

You can find a specific device data using three methods:

- Navigating the path from the Measurement menu - click **ROOT** or **Network/Monitored SUs** sites and then click the equipment icons.
- Searching for a specific equipment - see “Searching Measurements” on page 158
- Creating a specific sub-menu as a shortcut - see “Saving Items as A Submenu” on page 161

5.4 Measurements Display Options

5.4.1 Display Types

Three display types are available in the View group:

- **Icon:** (as in Figure 5-1) the elements of the hierarchy level under the selected item are shown with a big icon and name, up to 5 items in a row. The navigation can be continued by clicking on the icons.
- **List**: the elements appear with a small icon and name, which makes it possible to view many objects on a small screen.
- **Detailed**: elements are listed under each other with a small icon, name and description. Navigation is also performed by clicking on the icon.

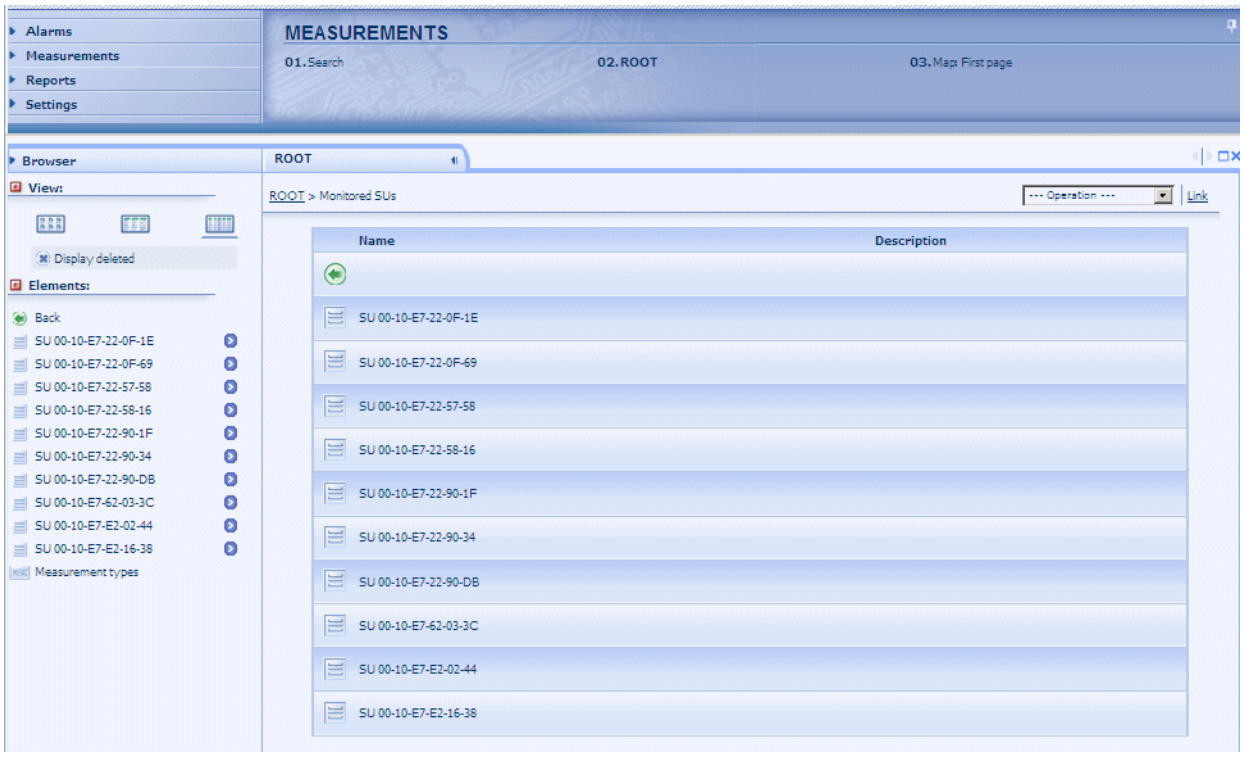


Figure 5-3: Navigation between Measurements: Detailed View

5.4.2 Element Browsing Options

The Elements group of the Browser also serves for the orderly display of the elements. The elements appear in a list, marked with a mini icon and a ► symbol.

If there are too many pieces of equipment on the current level, the Browser automatically groups them.

On the bottommost line of the Browser, you can browse all measurement types that are defined for the equipment under the current hierarchy level.

To browse elements:

Do one of the following:

- Click on the name of the object to continue the navigation on the left side.
- Click on the ► symbol to browse to the selected site or equipment; the elements under the selected equipment also appear in the currently active tab.
- In case of many equipments, click on a group to “unfold” it. The system stays at the same level, so clicking does not mean a hierarchy level has changed.
- Click **Measurement Types** to navigate the hierarchy and display only the elements that include the selected measurement type.

5.4.3 Operations Drop-Down Menu Options

The following functions are available for viewing measurement data (see Figure 5-4):

Figure 5-4: Measurements Operation drop-down Menu

- **Print Page** - sends the page to printer

- **Show history** - the application tracks the navigation of the user in the Measurements and in the Alarms menu and builds a history log from it. Each tab has its own log and each log entry contains the visited object, along with the used submenu and the selected date and time period. You can view this history log and either go back to a previous entry by clicking on the [view] link or open it in a new tab by right-clicking on the [view] link.

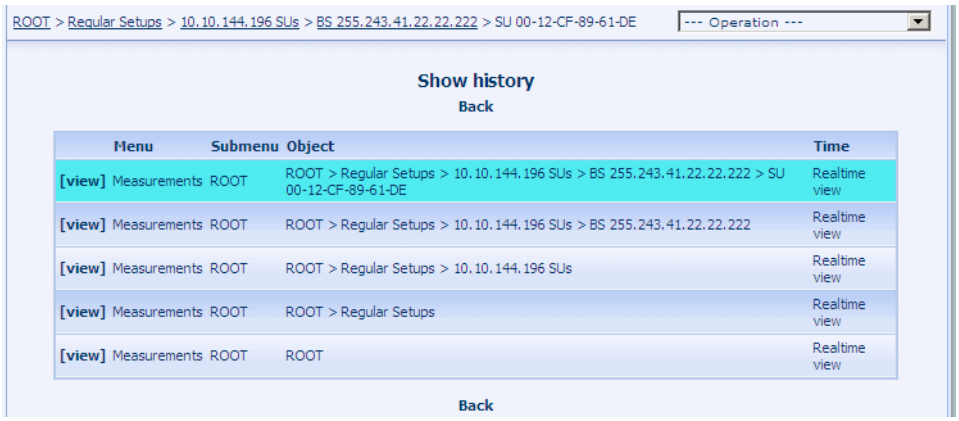

ROOT > Regular Setups > 10.10.144.196 SUs > BS 255.243.41.22.22.222 > SU 00-12-CF-89-61-DE
--- Operation ---
Show history
Back
Menu Submenu Object Time
[view] Measurements ROOT ROOT > Regular Setups > 10.10.144.196 SUs > BS 255.243.41.22.22.222 > SU 00-12-CF-89-61-DE Realtime view
[view] Measurements ROOT ROOT > Regular Setups > 10.10.144.196 SUs > BS 255.243.41.22.22.222 Realtime view
[view] Measurements ROOT ROOT > Regular Setups > 10.10.144.196 SUs Realtime view
[view] Measurements ROOT ROOT > Regular Setups Realtime view
[view] Measurements ROOT ROOT Realtime view
Back

Figure 5-5: Show History

- **Show links** - Displays three links, which jump directly to the currently viewed object when a new browser window is opened. The difference between the three links are the level of settings stored in them:
  - Object only - stores only the location of the object itself
  - Object with date and time - stores the selected date and time interval or the real-time display state
  - Object with every setting - stores every setting made in the Browser area.

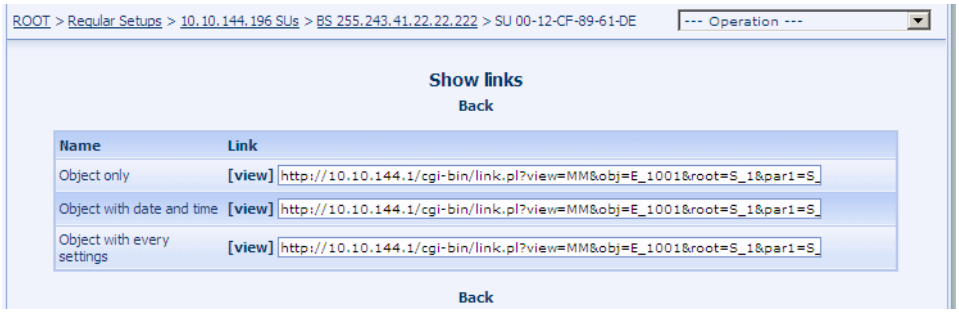

ROOT > Regular Setups > 10.10.144.196 SUs > BS 255.243.41.22.22.222 > SU 00-12-CF-89-61-DE
--- Operation ---
Show links
Back
Name Link
Object only [view] http://10.10.144.1/cgi-bin/link.pl?view=MM&obj=E_1001&root=S_1&par1=S_
Object with date and time [view] http://10.10.144.1/cgi-bin/link.pl?view=MM&obj=E_1001&root=S_1&par1=S_
Object with every settings [view] http://10.10.144.1/cgi-bin/link.pl?view=MM&obj=E_1001&root=S_1&par1=S_
Back

Figure 5-6: Show Links

- **Go to Alarms** - jumps to the Alarms main menu items while keeping the selected hierarchy item.

- **Logical BS History** (for 4Motion only) - Displays the BSs to which the a CPE (SU) has been connected during mobility, within the measured time (see Figure 5-7).

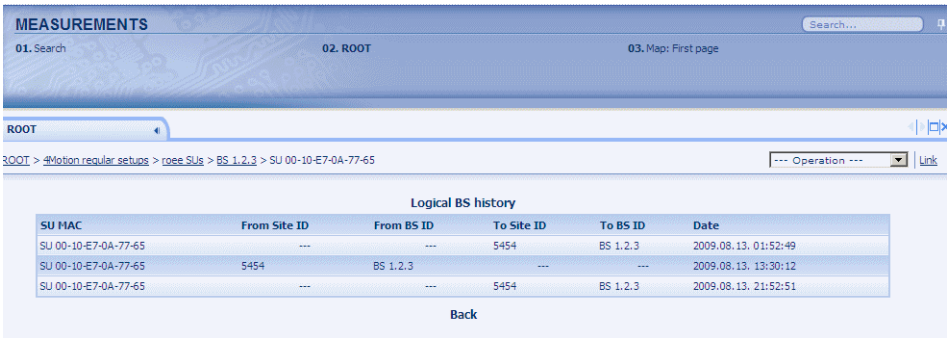


Figure 5-7: Logical BS History Window

- **Go to Configuration** - jumps to the Settings > Site and System Configuration page.

- **Save as submenu** - adds a submenu item at the top panel (see "Saving Items as A Submenu" on page 161).

5.5 Viewing Measurement Data

After reaching the equipment level using one of the navigation methods described above, the measurement results can be reviewed in chart format by selecting the concrete equipment.

You can export the measurement data to Excel by clicking the **Export to XLS** link at the top-right corner of each chart.

5.5.1 Setting Time Span

You can define the time span of measurements to be displayed. The following view options are available:

Table 5-1: Time Span Options

Icon	Tooltip	Description
	Realtime view	the data is updated periodically
	Historical view by date	A calendar is displayed. Select the desired day, week, month, and year to dispaly measurements for that time span
	Historical view by time	Specify the time interval (hours, seconds, etc.)

5.5.2 View Options

Because of minimizing the required chart drawings, the StarQuality draws only the first 20 charts, and the others are visible only when scrolling down the page.

You can set the chart display options in the **View** group:

- **Large Charts**: the charts appear in one column
- **Medium Charts**: the charts appear in two columns
- **Small Charts**: the charts are arranged in a three column table
- **Display Deleted** - Displays measurements of deleted equipments.

A chart always uses the whole available area, that is, if you hide the menu system using the expand page icon, or change the shape of the Browser window, then StarQuality redraws the chart(s) accordingly. The values specified here are applied to every chart on the right-hand side.

5.5.3 Chart Settings

The following chart settings are available:

- Flash - allows displaying the following options (see Figure 5-8):
  - » View or hide specific measurements by clicking their check-box
  - » Mouse-point on a spot displays the date, time and measurement values.
  - » Mouse-point on [Show details] displays the average, last, min. and max. values of the measurement
  - » Right-click and set a trendline calculation for any element.

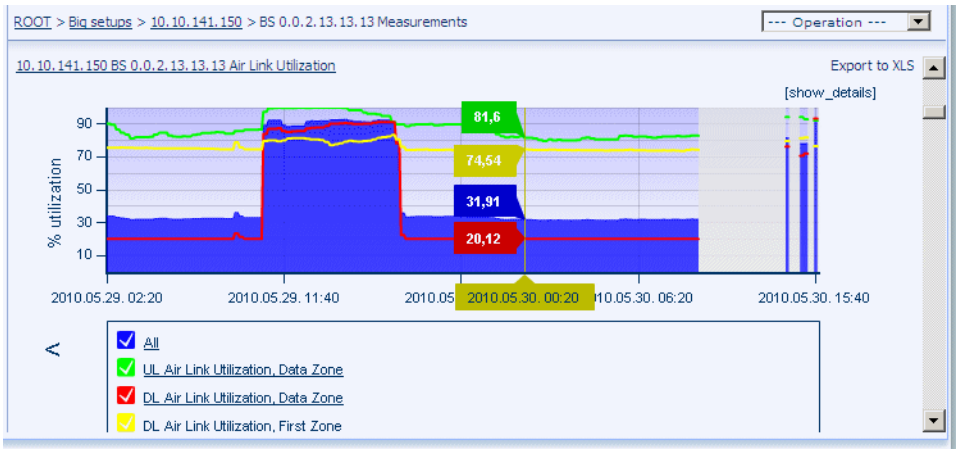


Figure 5-8: Display with Flash Options

- Peak - Default Yes No
- Resolution - Medium Small Large
- Minimum, Maximum values

Click **OK** to activate your settings.

5.5.4 Elements

The **Elements** group contains the measurements listed for the selected equipment. To display one chart per an individual measurements, click on the specific measurement.

Note that the elements in the main part of the display and in the **Elements** group of the **Browser** pane are not necessarily corresponding, that is, the StarQuality draws automatically only the fewest charts possible.

5.6 Searching Measurements

5.6.1 On Searching in General

Search strings are entered frequently in the StarQuality application in order to search by text or to filter the results. There are two types of searching methods: the complex search system, accessed from the Search menu item, and the simple filter system, used in other places.

For the Search menu item, the StarQuality application performs character based, case insensitive “whole text” matching.

Four special characters can be used in the search string:

- _ (underline) or ? (question mark): matches an arbitrary character
- % (percentage) or * (asterisk): matches zero or more arbitrary characters

Therefore, for example, the “_apple%” search string results in all names whose second to sixth characters are “apple” (regardless of case), followed by an arbitrary string of characters, that is, for example “Xapple123”, “aApPle”, “1AppleTree”, etc.

In other cases (filtering, charts editing, etc.), the StarQuality distinguishes small and capital letters, but the [?] and [*] characters do not have the special meaning mentioned above.

In order to search for text that includes a space, include the space in the string for search. For example, “<space>SU” will result in all names including SU with a space proceeding it.

For more information, refer to “Search (Admin only)” on page 221 (in Chapter 9)

Search is relevant to names of sites, equipment, etc. but not to IPs.

You can use the Measurements > Search menu item for displaying actual measurements.

After searching, use the `[view]` link next to the equipment to view the measurement charts.

To start searching for a measurement:

Specify a searching string, using one of the following methods:

1 Simple search: type the string directly in the input field, and click **OK**.

2 Click **Advanced Search**; an advanced window is displayed, which facilitates the construction of the searching string and contains the following insert fields:

   a **Search to parent name (Yes/No):** If you select “yes” the search finds those objects whose parent name meets the conditions (e.g. the parent is the containing site for a piece of equipment).

   b **Name:** Name of the object to be searched. The _ and ? characters match an arbitrary single letter, while % and * match an arbitrary string. The expressions in separate lines will be in OR relation with each other.

   c **Without:** Characters to be ignored by the system (the format is the same as above)

   d **Type:** The type of the object to be searched. Subtype can also be given for equipment, equipment template and measurement type.

   e **Display deleted:** Display measurements of deleted equipments

   f **Results count:** Maximum number of results

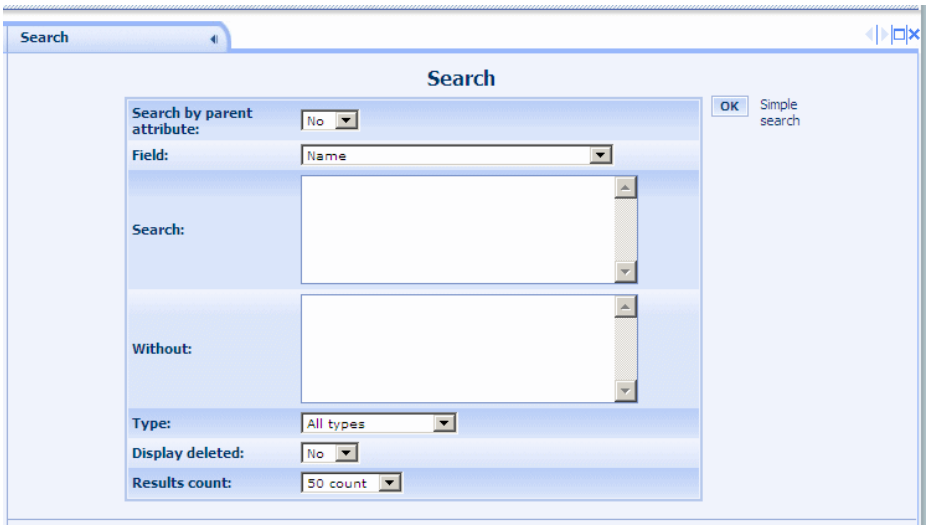


Figure 5-9: Advanced Search

3 Click **OK**; The results are displayed as well as the searching string as it could be given at simple search.

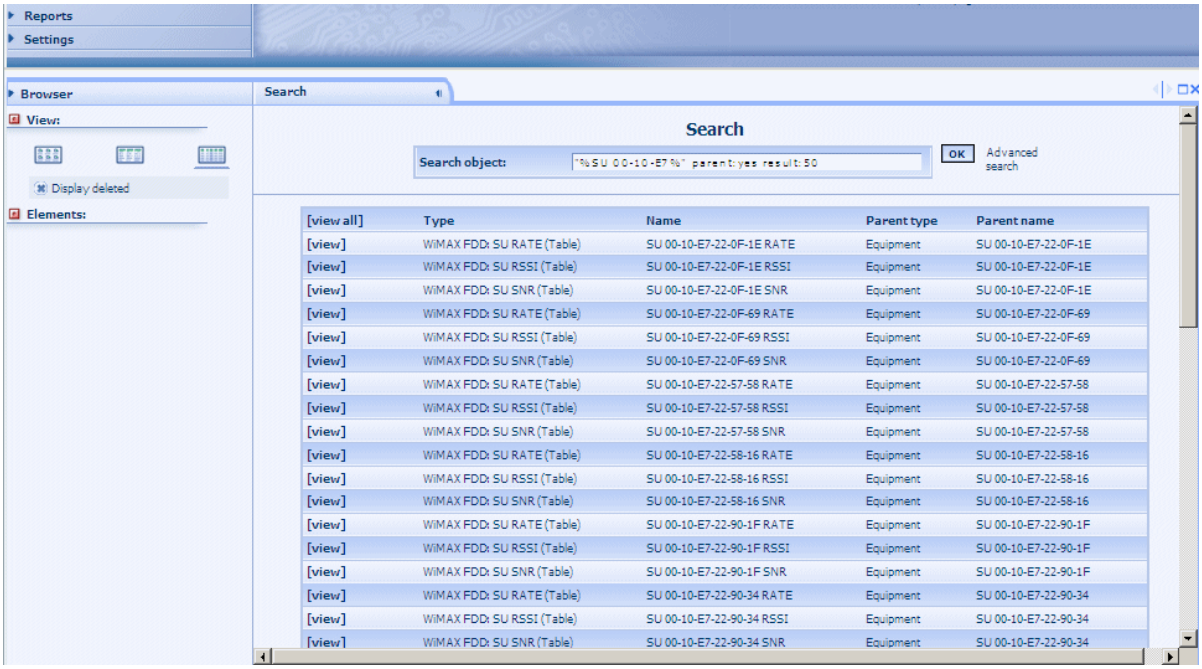

Reports
Settings
Browser
View:
Display deleted
Elements:
Search
Search
Search object:
OK
Advanced search
[view all] Type Name Parent type Parent name
[view] WiMAX FDD: SU RATE (Table) SU 00-10-E7-22-0F-1E RATE Equipment SU 00-10-E7-22-0F-1E
[view] WiMAX FDD: SU RSSI (Table) SU 00-10-E7-22-0F-1E RSSI Equipment SU 00-10-E7-22-0F-1E
[view] WiMAX FDD: SU SNR (Table) SU 00-10-E7-22-0F-1E SNR Equipment SU 00-10-E7-22-0F-1E
[view] WiMAX FDD: SU RATE (Table) SU 00-10-E7-22-0F-69 RATE Equipment SU 00-10-E7-22-0F-69
[view] WiMAX FDD: SU RSSI (Table) SU 00-10-E7-22-0F-69 RSSI Equipment SU 00-10-E7-22-0F-69
[view] WiMAX FDD: SU SNR (Table) SU 00-10-E7-22-0F-69 SNR Equipment SU 00-10-E7-22-0F-69
[view] WiMAX FDD: SU RATE (Table) SU 00-10-E7-22-57-58 RATE Equipment SU 00-10-E7-22-57-58
[view] WiMAX FDD: SU RSSI (Table) SU 00-10-E7-22-57-58 RSSI Equipment SU 00-10-E7-22-57-58
[view] WiMAX FDD: SU SNR (Table) SU 00-10-E7-22-57-58 SNR Equipment SU 00-10-E7-22-57-58
[view] WiMAX FDD: SU RATE (Table) SU 00-10-E7-22-58-16 RATE Equipment SU 00-10-E7-22-58-16
[view] WiMAX FDD: SU RSSI (Table) SU 00-10-E7-22-58-16 RSSI Equipment SU 00-10-E7-22-58-16
[view] WiMAX FDD: SU SNR (Table) SU 00-10-E7-22-58-16 SNR Equipment SU 00-10-E7-22-58-16
[view] WiMAX FDD: SU RATE (Table) SU 00-10-E7-22-90-1F RATE Equipment SU 00-10-E7-22-90-1F
[view] WiMAX FDD: SU RSSI (Table) SU 00-10-E7-22-90-1F RSSI Equipment SU 00-10-E7-22-90-1F
[view] WiMAX FDD: SU SNR (Table) SU 00-10-E7-22-90-1F SNR Equipment SU 00-10-E7-22-90-1F
[view] WiMAX FDD: SU RATE (Table) SU 00-10-E7-22-90-34 RATE Equipment SU 00-10-E7-22-90-34
[view] WiMAX FDD: SU RSSI (Table) SU 00-10-E7-22-90-34 RSSI Equipment SU 00-10-E7-22-90-34
[view] WiMAX FDD: SU SNR (Table) SU 00-10-E7-22-90-34 SNR Equipment SU 00-10-E7-22-90-34

Figure 5-10: Measurements Search Results

To use the Search results in Measurements:

1. To display the found objects click **[view]**.
2. If the results contain only measurements or charts, to display them together, click on the [view all] link; A page containing the charts is displayed.
3. To create a virtual equipment containing the displayed list of measurements or charts, click **[Save as Virtual Equipment]**.

NOTE

This method can substitute the manual selection of measurements and charts under the Customization menu item.

5.7 Saving Items as A Submenu

You can create a submenu item under the Measurements menu in order to have a shortcut to a selected item. This may save navigation time and searching for data. See also “Customizing Public (Admin only) and Private Menu Items” on page 236

To create a submenu item:

1. Click the equipment icon you want to create a shortcut to.
2. From the Operations drop-down menu select Save As Submenu.
3. Specify if this menu item should appear in Measurement or Alarms or both menus.
4. Click **OK**; the item appears in the Measurements/Alarms menu.

5.8 Setting Trendlines to Graphs

When working in Flash mode, StarQuality enables defining trendlines for displayed measurements.

You can also define thresholds using the trendline values.

To set trendlines:

1 When viewing a result table in Flash mode, right-click on the table itself and select **Set trendline**. The Set Trendline page is displayed.

The parameters in this page may vary depending on the equipment type and measurements

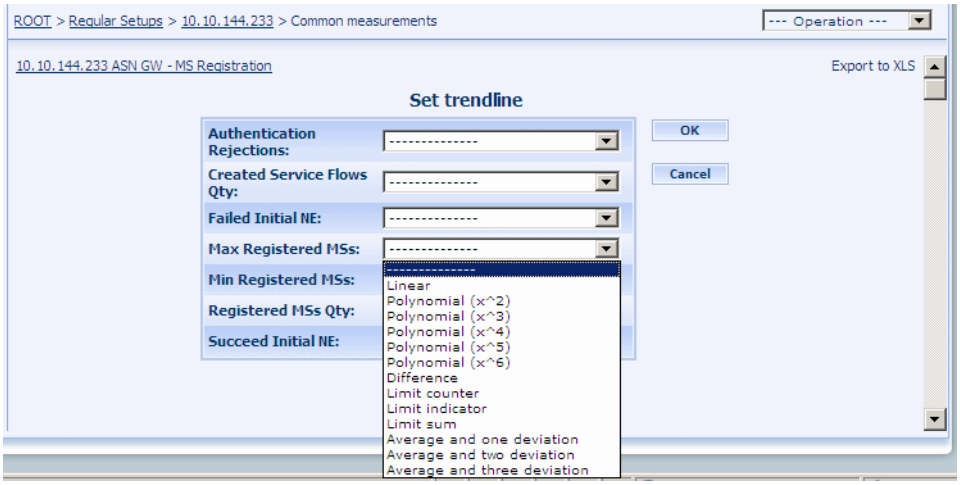


Figure 5-11: Setting Trendlines Window

2 For every entry, select one of the following trendline types from the drop-down list:

- Linear
- Polynomial (x^2) to (x^6)
- Difference - The difference between the current value and the previous value are shown
- Limits - Specify a condition value (e.g. > 10M) and a sample time (e.g the last hour). The following limit trendlines are available:
  - Limit counter - The number of times the condition was true in the time sample is shown as a trendline.
  - Limit indicator - A transparent red area is shown when at least one time the condition was true in the time sample
  - Limit sum - The sum of the measurement values based on the same time interval
- Average and deviation - three trend lines are displayed, showing the average of the element as well the plus and minus deviation. The following trendlines are available:
  - Average and one deviation
  - Average and two deviations
  - Average and three deviations

The following figure shows a few examples of setting trendlines.

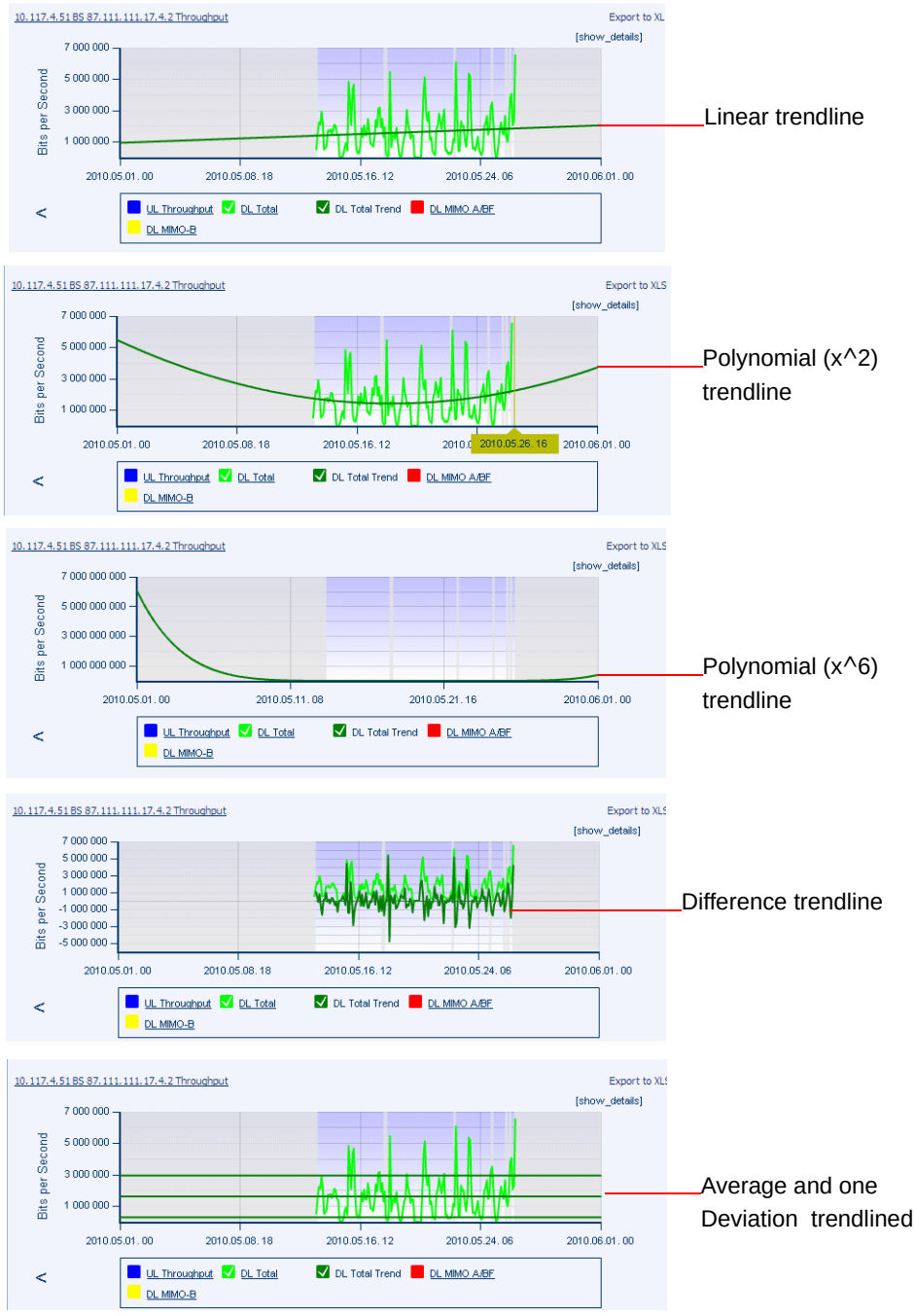


Figure 5-12: Examples of Trendline Settings

Chapter 6

Setting Alarm Thresholds

In this chapter:

- "Overview" on page 167
- "Creating and Editing Threshold Templates" on page 168
- "Assigning Threshold Templates to Equipments" on page 172
- "Editing Thresholds" on page 175
- "Creating a Threshold (Not Based on Template" on page 178
- "Generating the Expression Using Input Fields" on page 179

6.1 Overview

Setting alarm thresholds is available for Admin users only.

Thresholds are defined in the StarQuality system in order to trigger alarms when the values exceed the threshold. There are two main threshold types:

- **Normal** - triggers an alarm based on an expression containing one or more measurement values.

- **Grouped** - triggers an alarm depending on normal alarms rather than measurements: it will alarm when there are more alarms than the threshold limit specified in the expression on a normal or virtual site or a given device. The grouped alarms can summarize all possible types of alarms.

The defined thresholds can be complex expressions using different measurements of different devices within different sites. You can also use templates to build thresholds. This manual describes creating normal measurement templates and assigning them to equipments.

The process of adding, viewing and modifying thresholds depends on whether it is initiated from the menu (Settings > Thresholds > Configuration), or from the Equipment Configuration page. The difference between these options is the sets of displayed thresholds and selectable objects, and the displayed measurement names.

This chapter focuses on creating threshold templates and assigning them to equipment.

6.2 Creating and Editing Threshold Templates

Creating thresholds using a template enables the creation of more thresholds, even for the same measurement. First you create the template and then you assign it to a specific equipment. You can also configure the assigned threshold locally.

6.2.1 Creating a New Threshold Template

This section describes how to create a new template (not based on an existing one) and how to configure it.

To create a new threshold template:

1 From Settings select Templates > Threshold Templates; The Threshold Template Configuration list is displayed.

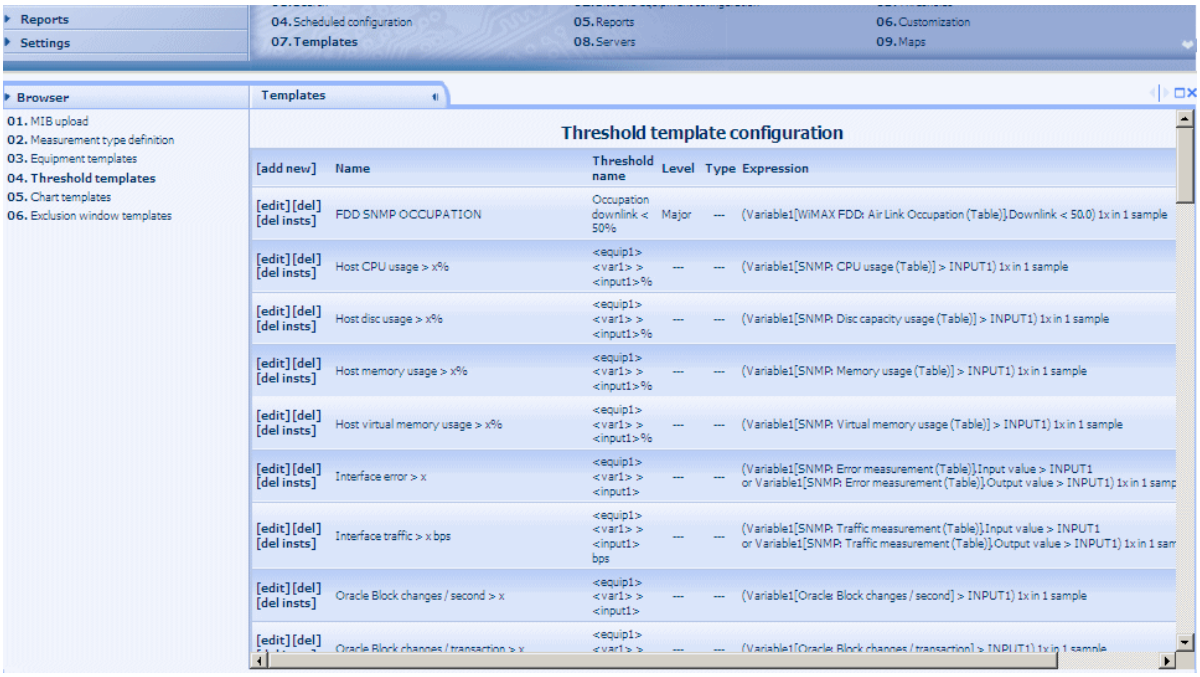


Figure 6-1: Threshold Template Configuration - Template List

2 Click **[add new]**; The Threshold Configuration editor displays an empty template table.

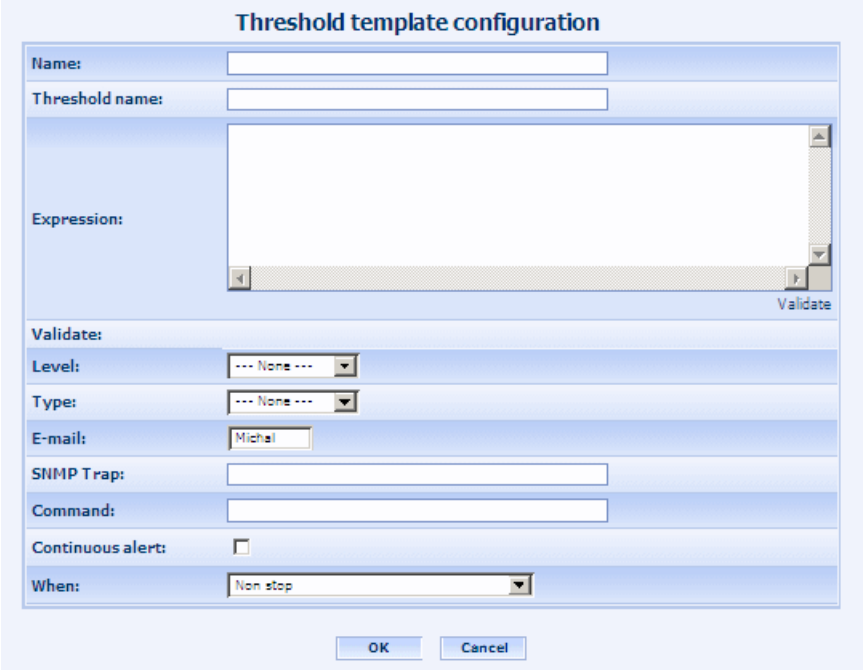


Figure 6-2: Threshold Template Configuration - New

3 Fill in the fields with the following information:

- **Name**: Template name: For example: ”FDD SNMP OCCUPATION too low”
- **Threshold name:** A unique and meaningful name. For example: ”FDD SNMP OCCUPATION < 80%”.
- **Expression:** The threshold format. The application displays the expression in text format, while editing the expression is displayed in its original form in case of normal thresholds, and as different input fields for grouped alarms. See Step 4 below.
- **Level:** The possible threshold values in decreasing severity levels:
  - » Critical (red background)
  - » Major (orange background)
  - » Warning (yellow background)
  - » Minor (cyan background)

- **Type:** Not applicable.

- **E-mail:** The e-mail address(es) to which the application should send a message if there is threshold violation. Select one or more e-mail addresses by highlighting (and using the CTRL and Shift keys) the required address(es) from the predefined list (refer to "Setting E-mail Addresses (Admin only)" on page 243). A prerequisite for the actual e-mail notifications is activating the SMTP server (see "Northbound Interface (NBI)" on page 266)

- **SNMP Trap:** Address(es) and port(s) to where the application should send an SNMP trap if there is a threshold violation. Zero or more e-mail addresses can be given, separated by commas. The format of the individual addresses: [community@]computer_name[:port]. If you do not set an explicit community, public is used by default. If you do not set an explicit port, it is 162 by default. The system also sends the variable causing the violation in the SNMP trap, but only if there is only one variable in the threshold definition and its current value can be stored in 32 bits. A prerequisite for the actual trap sending is network connection on the chosen port between the StarQuality server and the trap receiving application machine.

- **Command:** Not applicable

- **Continuous alert:** If selected, at each violation the appropriate e-mail and/or SNMP trap is sent. If not selected, this will be done only if there was no violation during the previous measurement. In both cases, the system will send an e-mail and/or SNMP trap when the threshold violation is ended.

- **When:** Which time period template is used for the threshold. The possible options are set in Settings > Templates > Exclusion Window Templates.

4 Specify the threshold attributes in the **Expression** section:

The threshold syntax contains 4 parts, separated by a [#] key. That is: <value(VARx)> <comparators (=><)> <reference value> <frequency>. You can also have relations between expressions: Or/ And.

Examples:

- Name: Subscription downlink>100% for FDD SNMP
  Syntax: #VAR1.O#WMP.IN > 100.0#1#1#

Meaning: Variable value 1.0, WMP (subscription) measurement downlink, should be greater than 100%, at least once per one measurement.

- Syntax: #VAR1.O#WOCC.OUT < 50.0#1#1# for FDD SNMP
  Validation: (Variable1[WiMAX FDD: Air Link Occupation (Table)].Downlink < 50.0) 1x in 1 sample
- Syntax: #VAR1.O#TOCC.IN < 70.0#2#3# for FDD
  and
  #VAR1.O#TOCC.OUT < 50.0#3#3#

  Validation: (Variable1[WiMAX TDD: Air Link Utilization (Table)].Uplink < 70.0) 2x in 3 samples
  and
  (Variable1[WiMAX TDD: Air Link Utilization (Table)].Downlink < 50.0) 3x in 3 samples

For lists of syntax elements for thresholds, refer to Chapter 11.

Usually only the following part of the Perl syntax is necessary:

- and: and expression
- or: or expression
- +, -, *, /: mathematical operations
- (,): punctuation
- !: logical negation
- <, <=, ==, >=, >: value comparators

Alternatively you can create the template without expression and later edit the threshold locally using input field. See detailed information in “Generating the Expression Using Input Fields” on page 179.

5 Click **Validate**. If the syntax is red, fix it according to the above.

6 Click **OK**; A new threshold template is added to the system.

6.3 Assigning Threshold Templates to Equipments

To assign a threshold template to multiple equipments:

1 From Settings select Threshold > Configuration. The threshold list is displayed.

2 Click **[from template]**.

3 Choose a threshold template from the drop-down list. The Threshold Configuration editor displays the attributes of the template.

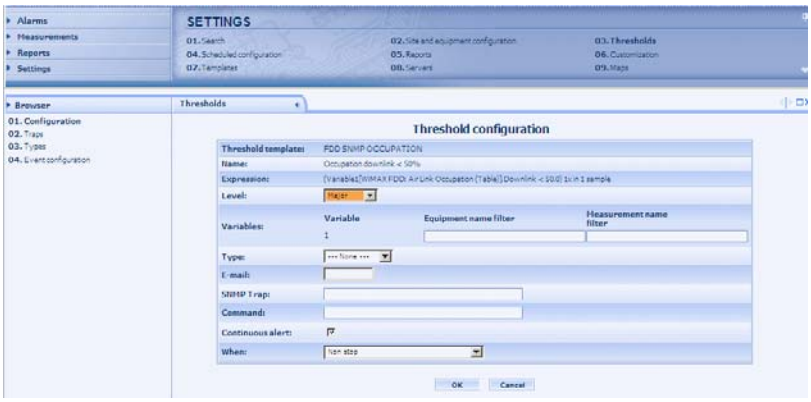


Figure 6-3: Using Threshold Template

4 If required, edit the values in the template.

5 Click **OK** to view the list of relevant equipments for this threshold template. All are checked by default, and you can select the equipment(s).

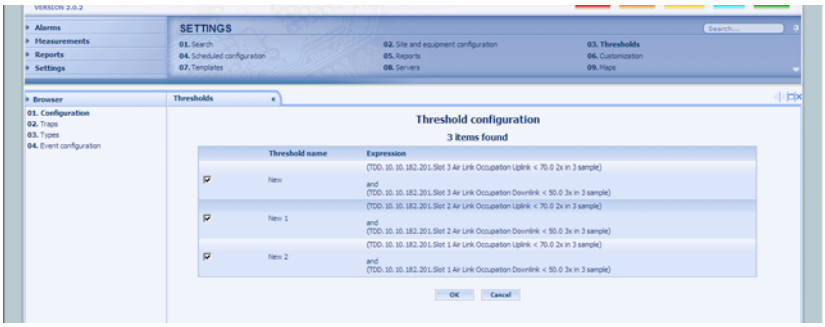


Figure 6-4: Relevant Equipments

6 Click **OK**; The system creates the selected thresholds.

To assign a threshold from template to a specific BTS:

1 Access the Site and Equipment Configuration in one of the following methods:

- From Measurements, select the equipment and from the Operations pull-down menu select Go To Configuration.
- From Settings select Site and Equipment Configuration.

2 Scroll down to the Threshold section and click **[From Template]**, or choose New Threshold from Template from the operations drop down menu.

3 Select a template from the list to assign to the threshold and click **OK**; the system displays the threshold template details. You can modify the attributes as required.

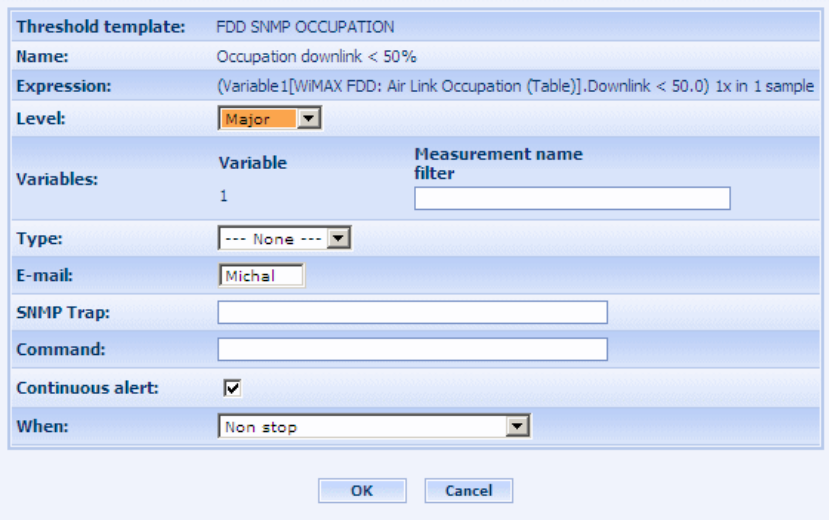


Figure 6-5: Threshold Template Details

4 Click **OK**; The system finds items (AUs or SUs) belonging to this BTS to which to assign the template.

3 items found
Threshold name
Expression
Occupation downlink < 50% 3
(FDD SNMP.10.0.16.20.Slot 1 Air Link Occupation Downlink < 50.0 1x in 1 sample)
Occupation downlink < 50% 4
(FDD SNMP.10.0.16.20.Slot 2 Air Link Occupation Downlink < 50.0 1x in 1 sample)
Occupation downlink < 50% 5
(FDD SNMP.10.0.16.20.Slot 3 Air Link Occupation Downlink < 50.0 1x in 1 sample)
OK
Cancel

Figure 6-6: Items to Assign The Threshold

5 Select the AUs/SUs to assign the threshold to and click **OK**. The threshold is added to the list of thresholds for the equipment.

6.4 Editing Thresholds

6.4.1 Editing an Existing Threshold Template

When you edit an existing template on which active thresholds are based, all these thresholds are automatically affected. The system identifies and lists these potentially affected thresholds for approval.

To edit a threshold template:

1 Do one of the following:

- From Settings select Templates > Threshold Templates. The Threshold Template Configuration list is displayed.
- From Settings select Site and equipment configuration. Navigate to the equipment holding the threshold to be edited. Scroll down to the thresholds list.

2 Click **[edit]** next to the threshold template to be modified.

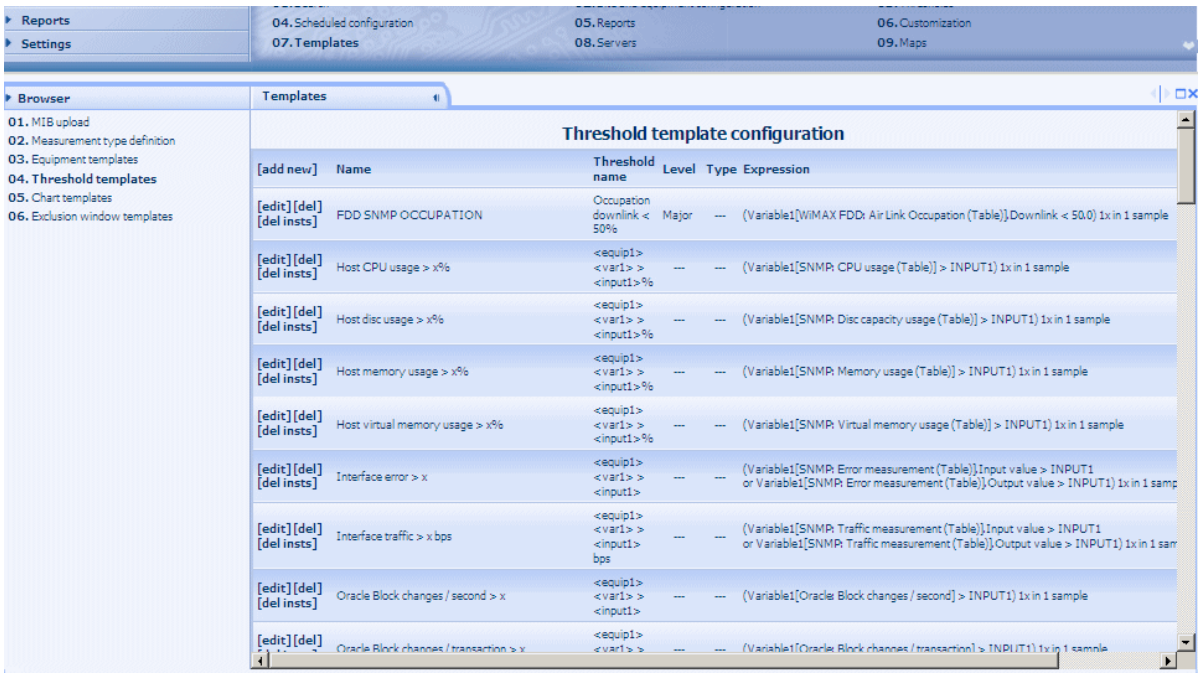


Figure 6-7: Threshold Template Configuration - Template List

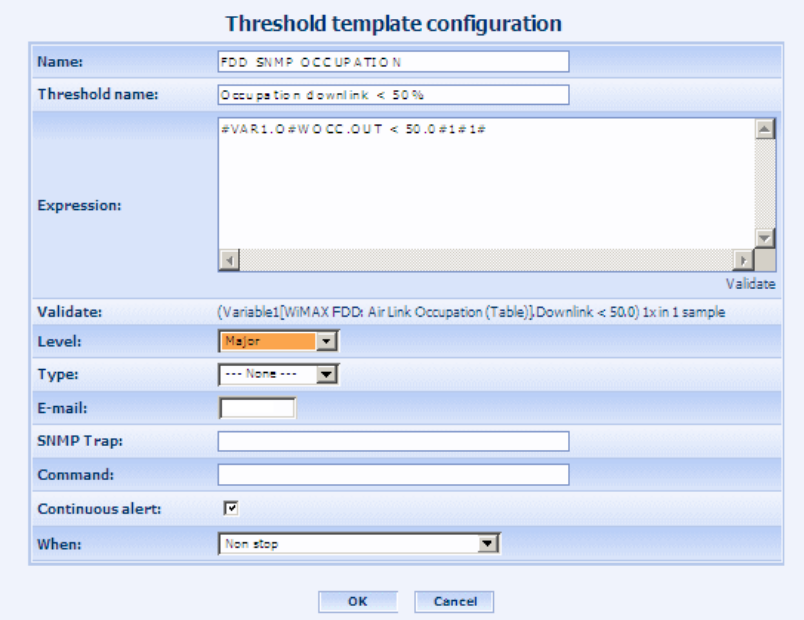


Figure 6-8: Threshold Template Configuration - Editing

3 Modify the required threshold attributes (see detailed information in "Creating a New Threshold Template" on page 168).

4 Click **OK** to save your modification to the template.

If no thresholds are based on this template, the modifications are saved and the list of threshold templates reappears.

If there are thresholds based on this template, the Threshold Configuration editor displays the modified attributes and lists these potentially affected thresholds for approval (Figure 6-9).

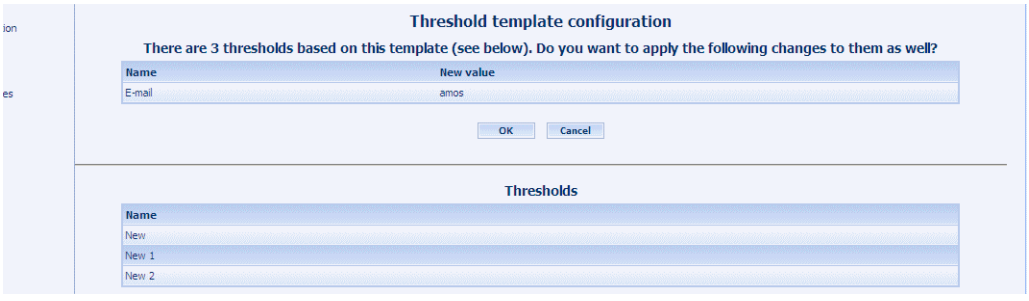


Figure 6-9: Message on Template-based Threshold Modification

The settings made here will override any local change in each of these thresholds. To avoid loosing such local changes, you may consider modifying the template and not the threshold itself.

Clock **OK** to save the modification; the list of threshold templates reappears.

6.4.2 Editing a Template-based Threshold (Local Change)

Editing the threshold template itself will override any local change in thresholds. To avoid loosing such local changes, you may consider modifying the template and not the threshold itself.

To edit a template-based threshold:

1. From Settings select Threshold > Configuration. The Threshold list is displayed.
2. Select a specific threshold and click **[edit]**; the following message appears:

Figure 6-10: Message on Template-based Threshold Modification

3. Click **OK**; the Template Configuration window is displayed.
4. Modify the required threshold attributes. You can use the input fields as described in "Generating the Expression Using Input Fields" on page 179.
5. Click **OK** to save your modification to the threshold.

6.5 Creating a Threshold (Not Based on Template

To create a non-template-based threshold:

1 From Settings select Site and Equipment Configuration.

2 Navigate to the equipment for which you want to create a local threshold and scroll down to the Threshold section.

3 Click **[add new]**; the threshold configuration parameters are displayed.

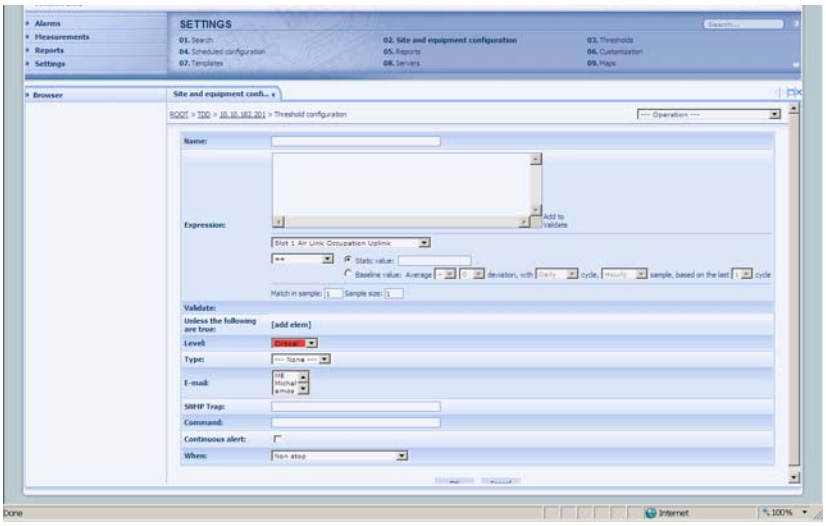


Figure 6-11: Adding a New Threshold

4 Fill in the required threshold attributes. You can use the input fields as described in "Generating the Expression Using Input Fields" on page 179.

5 Click **OK** to save your modification to the threshold.

6.6 Generating the Expression Using Input Fields

This section provides basic rules for creating threshold expressions using input fields. Input files are not available when creating or editing threshold templates.

You can use the input fields in the Threshold Configuration window (Figure 6-12) available in the following cases:

- Creating or editing a threshold that is not template-based
- Locally modifying a template-based threshold (see "Editing a Template-based Threshold (Local Change)" on page 177)

To generate a threshold expression:

1 Access the Threshold Configuration window (Settings > Thresholds > Configuration.

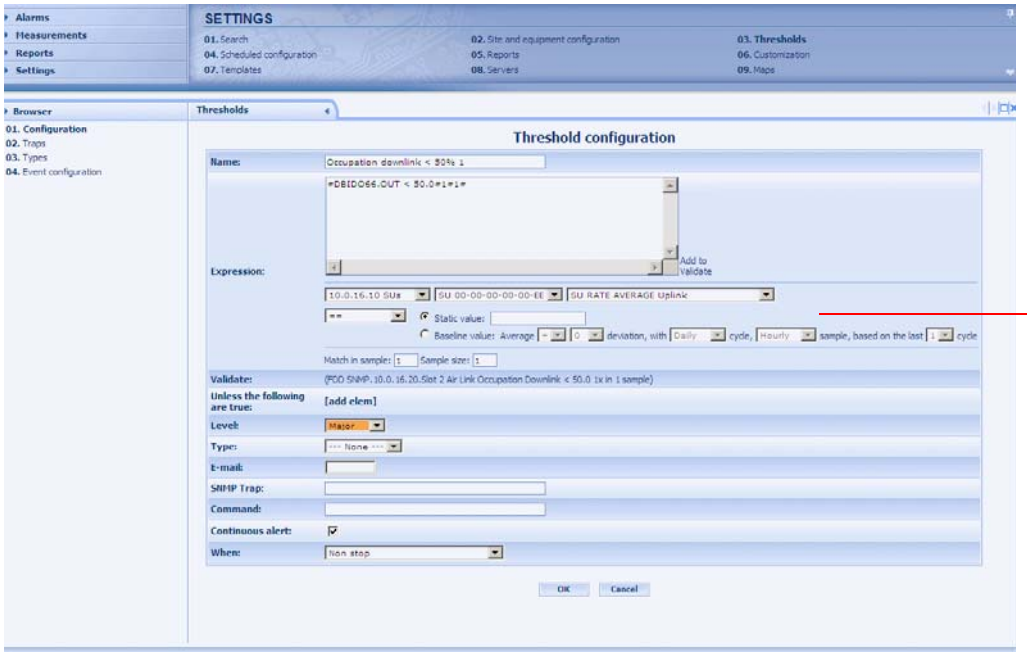


Figure 6-12: Threshold Configuration

2 In the Threshold Configuration page fill in or select the following fields as required:

- The site and equipment of the measurement drop-down fields are displayed only when opening the threshold editor from the main page. If you edit the thresholds from the Equipment page, you can choose the measurements belonging only to that specific one.
- The measurement to be selected
- Operator
- Compare value:
  - **Static value**: interpreted with the same measurement unit as the one displayed on the measurement chart. If there is a single measurement in the sub-expression, the application draws a horizontal line on the measurement chart at the compare value.
  - **Vaseline value**: the average of the measured values calculated with the specified cycle and resolution + or – a multiple of the standard deviation
- Frequency
- In how many samples
- Based on the last x cycles
- Match in sample
- Sample size

3 Click the **[Add to]** link; The application inserts the required element at the current cursor position in the text, which can be of one of the following two types depending on the values of the fields:

- If the compare value is filled, the application inserts a complete sub-expression element, namely:

  ```
  #selected_measurement_code operator compare_value#frequency#in how many#
  ```

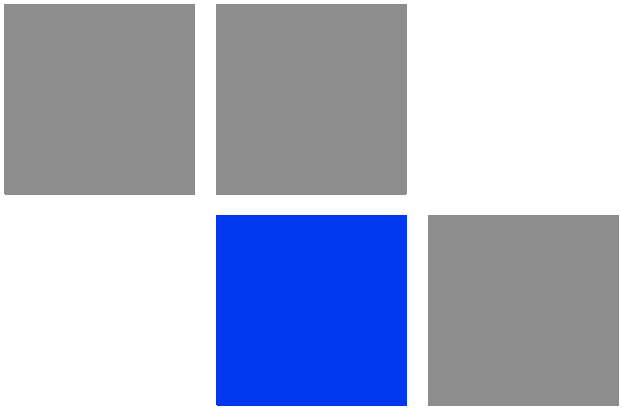
- If the compare value is not filled, the application inserts only the code of the selected measurement.

4 Anytime during the editing process you can click on the **[Validate link]** to check whether the expression has the required syntax. If the syntax is invalid, an error message is displayed, and if it is valid, the user readable format of the expression is displayed in the validate field.

Usually only the following part of the Perl syntax is necessary:

- and: and expression
- or: or expression
- +, -, *, /: mathematical operations
- (,): punctuation
- !: logical negation
- <, <=, ==, >=, >: value comparators

The list of Thresholds syntax elements is in Table 11-5.



Chapter 7

Threshold-Crossing Alarms Monitoring

In this chapter:

- "Overview" on page 184
- "Navigating, Viewing and Filtering Alarms" on page 186
- "Downloading Data to Excel Files" on page 191

7.1 Overview

Viewing Alarms is performed similarly to viewing measurements: a configurable quick menu at the top panel is used for displaying and navigation, and also new elements can be added to it using the Settings > Customization menu.

The alarms are displayed on the most prominent parts of the user interface to provide quick accessibility. The color-coded summary of the currently active alarms are displayed at the top-right corner of the window. The alarms can be navigated by selecting the Alarms item on the main menu.

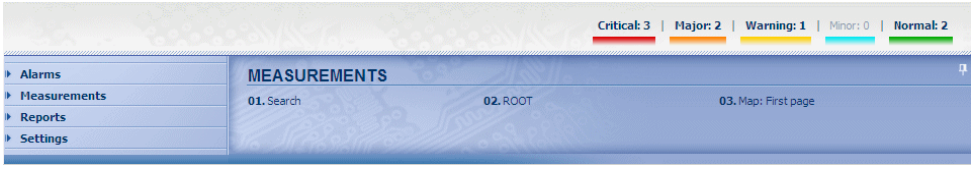


Figure 7-1: Alarms Summary at the Top Right Corner of the Window

By default, only the “Root” highest level group is listed.

The list view of alarms is displayed in the following figure:

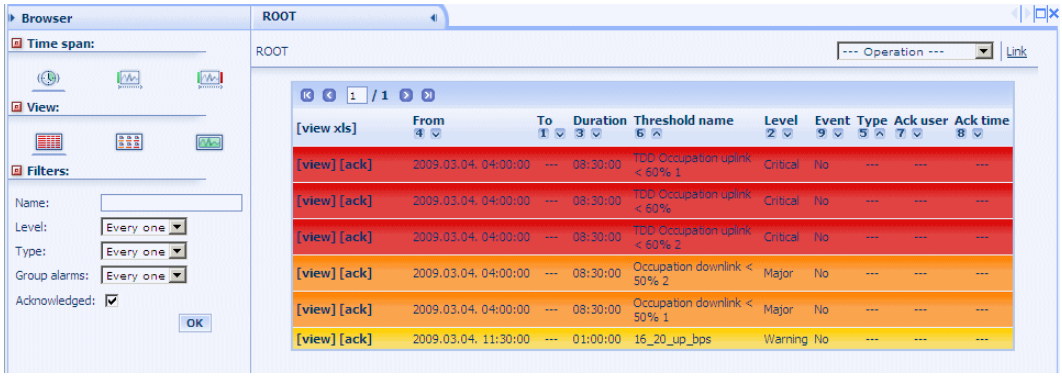

Browser
Time span:
View:
Filters:
Name:
Level: Every one
Type: Every one
Group alarms: Every one
Acknowledged:
OK
ROOT
ROOT
--- Operation ---
Link
1 / 1
[view xls] From To Duration Threshold name Level Event Type Ack user Ack time
[view] [ack] 2009.03.04. 04:00:00 --- 08:30:00 TDD Occupation uplink < 60% 1 Critical No
[view] [ack] 2009.03.04. 04:00:00 --- 08:30:00 TDD Occupation uplink < 60% Critical No
[view] [ack] 2009.03.04. 04:00:00 --- 08:30:00 TDD Occupation uplink < 60% 2 Critical No
[view] [ack] 2009.03.04. 04:00:00 --- 08:30:00 Occupation downlink < 50% 2 Major No
[view] [ack] 2009.03.04. 04:00:00 --- 08:30:00 Occupation downlink < 50% 1 Major No
[view] [ack] 2009.03.04. 11:30:00 --- 01:00:00 16_20_up_bps Warning No

Figure 7-2: Table View of Alarms

To use the Alarms list:

Use the following operations in the alarms list:

Table 7-1: Using the Alarms List

To	Do this	Comments
Move to next page/entries on the list	Use the arrows (< >) at the top of the list	
Sort the list by column entries	Click on the column header	
Sort in ascending/descending order	Click the up/down arrows under the column header	The numbers indicate the order
Download the table	Click the **[view xls]** link	
Obtain detailed information of an entry	Click the **[view]** link	the corresponding measurement values are displayed in a chart.
Acknowledge an alarm	Click the **[ack]** link	if the alarm has already been acknowledged, the time and name of the user that acknowledged are displayed in the table.
Delete (close) an alarm	Click the **[ack]** link (if available)	If the alarm is not a threshold violation but is from an event definition, and the event has not yet been closed, a [del] link appears.

Deleting an alarm is necessary, for example, if there is no closing event in the definition or a trap has been lost, or if the alarm is not relevant anymore. In this case, if the alarm has not been acknowledged yet, then it becomes acknowledged as well.

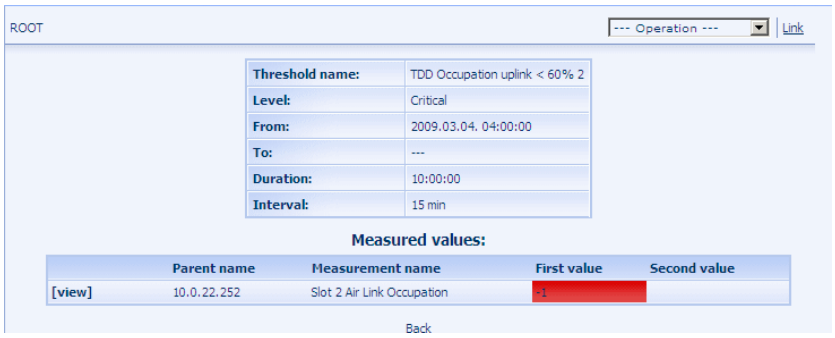


Figure 7-3: Detailed Alarm Information

7.2 Navigating, Viewing and Filtering Alarms

The browser**,** at the left-hand side of the user interface under the main menu, is used to filter and arrange the alarms. There are three *groups* in the Browser, each controls the display of alarms. The individual groups can be expanded or collapsed and by clicking on the button on the left edge next to them, which can be useful since this panel has no scroll bar. A *tooltip* is also displayed if the mouse pointer is moved above the group icon.

Filtering of alarms can only be set with these groups if a set of alarms is already selected on the top part of the screen.

The following sections explain in details the individual groups.

7.2.1 Viewing Alarms by Time Span

You can define the time span of alarms to be displayed. The following view options are available in this group:

Table 7-2: Time Span Options

Icon	Tooltip	Description
	Realtime view	The currently active alarms are displayed
	Historical view by date	A calendar is displayed. Select the desired day, week, month, and year to dispaly alarms during that time
	Historical view by time	Specify the time interval (hours, seconds, etc.)

7.2.2 Alarm View Options

The way the alarms are displayed can be changed using the second group of controls.

7.2.2.1 Main View Options

The following view options are available in this group:

Table 7-3: Alarms View Options

Icon	Tooltip	Description
	Table view	The alarms are displayed in a list table. This is the default view. Refer to “Overview” on page 184, and Figure 7-2.
	Object view	The current site hierarchy is displayed with icons instead of the table of alarms. The color of icon indicates the most severe alarm existing for this item. See detailed description of this view below (“Object View Options” on page 187).
	Chart view	The number of active alarms are displayed in a graphical form (see “Chart View” on page 190).

7.2.2.2 Object View Options

By selecting the “Object view” icon, the current site/virtual site hierarchy is displayed with icons instead of the table of alarms. Only those sites for which there is an active alarm are visible. The icons are colored by the color code of the most severe alarm of the contained equipment: for example, if under a site there is an equipment with am active “Critical” alarm, the color of the site’s icon is red; if the most severe active alarm of the equipment under the given site is “Major”, then its color is orange, and so forth.

During navigation the navigation path is displayed in the top line above the middle viewing area (under the name of the tab), which can be used to quickly navigate up to higher levels by clicking on its segments.

In the “Object view”, three further icons are available, which are used to further simplify the object view:

- **Icon view**: The sites containing alarms are displayed with large, easy-to-see icons, up to five in a row.

Figure 7-4: Icon View of Alarms

- **List view:** The sites containing alarms are displayed with smaller icons (up to five in a row) allowing more icons to be displayed on a single screen. Icons with alarms can easily be identified based and their color codes.

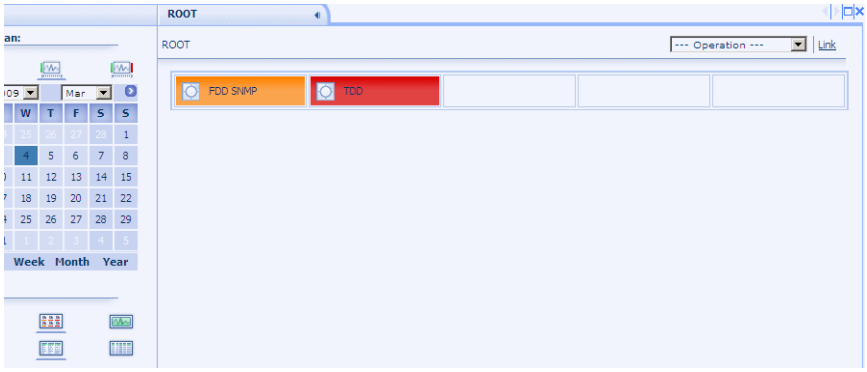


Figure 7-5: List View of Alarms

- **Detailed view:** The site/equipment icons are listed one under another (still colored) together with their names and descriptions

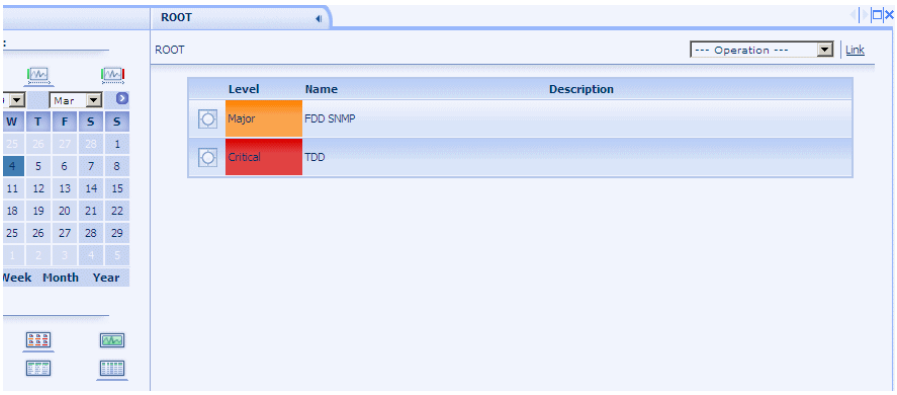


Figure 7-6: Detailed View of Alarms

In each of these views, you can navigate to a site by clicking on its icon, in which case the contained sites and equipment are displayed in a similar view. Tracking the hierarchy downwards you can reach the equipment causing the alarm, and then by clicking on the icon of this equipment the name of the violated threshold and the chart of the referenced measurement values are displayed. On this lowest level you can also choose a threshold that is currently not violated in order to check the settings of the threshold value.

If the alarm is not threshold but event based, then the StarQuality displays the time of alarm on the chart with superimposed transparent red rectangles.

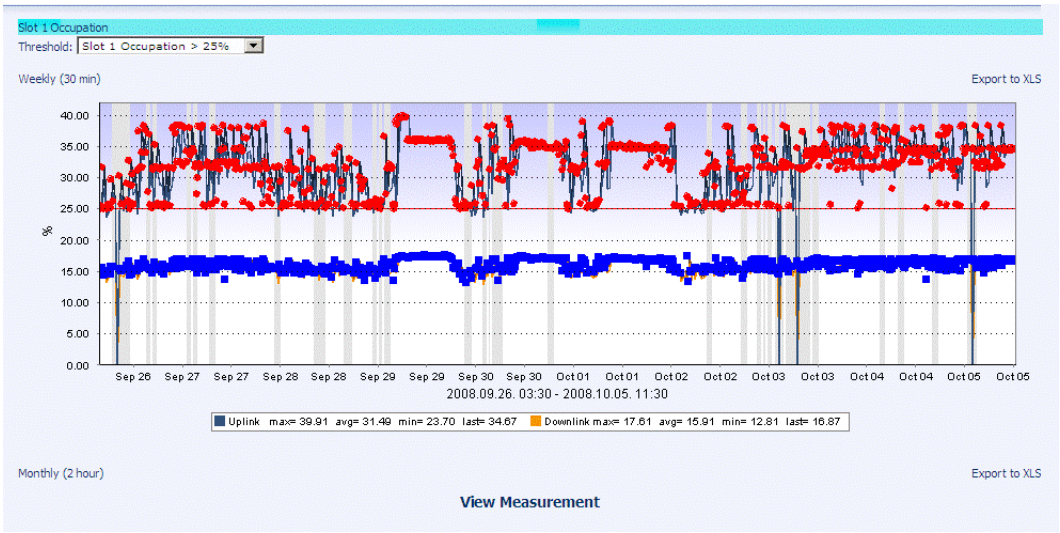


Figure 7-7: The Equipment Level View of Alarms

7.2.2.3 Chart View

This view can only be selected if the current time interval is *not* the real-time/Auto refresh view (that is, for historical time intervals that do not contain the current time instant).

7.2.3 Filtering Alarms

In the alarms browser, the third group “Filters” allows the specification of filter-conditions of alarms. Filtering is available using the following types:

Table 7-4: Filtering Types

Type	Description
Name	The name of the threshold (which typically contains the name of the corresponding equipment, such as “E1909 low availability”). The usual % and _ characters can be used here. Most useful in the List view.
Level	A dropdown list, used to filter on the severity level: Critical, Major, Warning, Minor).
Type	A dropdown list, used to filter on the threshold type.
Grouped	A dropdown list, used to set whether the normal and/or the grouped alarms should be displayed.
Acknowledged	Display acknowledged alarms - Yes/No

7.3 Downloading Data to Excel Files

You can download the displayed data in XLS format. The generated XLS file containing the measurement data also includes the name of the threshold, and the background color of the data cells that violate the threshold matches the color code of its severity level. If threshold violation occurred, but that value was not taken into account in the current alarm, then the background color of the cell is set to cyan.

If a public or private (as opposed to normal) chart is exported to an XLS file, the generated file differs in the following aspects:

- The number of columns and their names are the same as in the chart definition
- Regardless of the chart definition the values are not aggregated
- The resolution of rows follows the smallest time interval of the measurement data, thus infrequent measurement data are stored sparsely in the table

To save data to Excel:

- To save the alarms table click **[view xls]**; open or save the file.

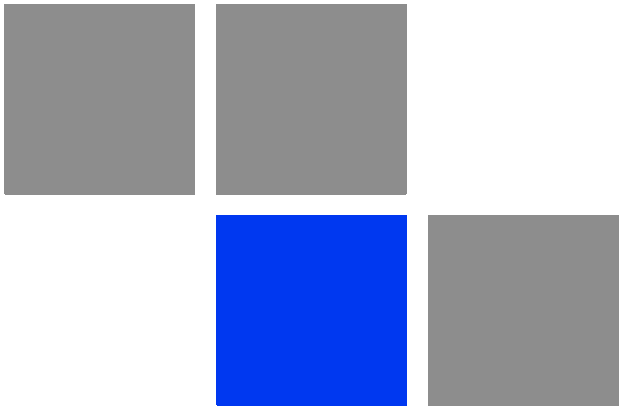
	A	B	C	D	E	F	G
1	**Created by:**	**Administrator**		**When:**	**2009.03.04. 14:31:45**		
2	**From date:**	**2009.03.04. 14:31:31**		**To date:**	**2009.03.04. 14:31:31**		
3							
4	**From date**	**To date**	**Duration**	**Threshold name**	**Level**	**Ack user**	**Ack time**
5	2009.03.04. 04:00:00		10:15:00	Occupation downlink < 50% 1	Major		
6	2009.03.04. 04:00:00		10:15:00	Occupation downlink < 50% 2	Major		
7	2009.03.04. 11:30:00		02:45:00	16_20_up_bps	Warning		
8							
9							

Figure 7-8: Sample XLS of Alarm Table

- To save the chart data, click **[Export to XLS]** above the chart. The first few lines of a sample exported XLS file are:

	A	B	C	D	E	F	G
1	**Parent name:**	10.0.16.20		**Parent description:**			
2	**Measurement typ**	Air Link Occupation		**Measurement na**	Slot 1 Air Link Occupation		
3	**From date:**	2009.03.04. 11:45		**To date:**	2009.03.04. 12:45		
4	**Created by:**	Administrator		**When:**	2009.03.04. 14:07:29		
5	**Unit:**	%		**Remark:**			
6	**Interval:**	15 min		**Threshold name**	Occupation downlink - Level		Major
7							
8	**Time**	**First value**	**Second value**				
9	2009.03.04. 11:45:00	39.7	17.8				
10	2009.03.04. 12:00:00	39.7	24.6				
11	2009.03.04. 12:15:00	39.4	45.6				
12	2009.03.04. 12:30:00	38.6	50.2				
13	2009.03.04. 12:45:00	38.6	50.1				
14							

Figure 7-9: Sample XLS File of Chart Data



Chapter 8

Reports

In this chapter:

- "Overview" on page 195
- "Report Configuration" on page 196
- "Viewing Reports" on page 207
- "Bulk Export Wizard - Exporting Data to XLS Files" on page 210

8.1 Overview

StarQuality enables the following types of reports:

- Built-in and configurable reports
- Filtered data exported to *.xls* format

8.1.1 Built-in Reports

These reports are variable evaluations on a chosen set of sampled objects (AUs, SUs, measurements) in the system. Administrator users can configure selected subsets, variables and reports views.

Each report can be one of the following:

- Predefined reports - The system is installed containing the same set of four reports for most device types:
  - » BottomN Uptime
  - » TopN Air Link Utilization (not applicable to BreezeACCESS VL and Extreme)
  - » TopN Sector Throughput
  - » TopN Number of Connected SUs

  For details on device specific information, refer to Chapter 11.
- Regular reports - Each report-view is manually configured following the definitions of its variables, and begins collecting data from its creation time and on. Refer to “Regular Reports” on page 196
- On-demand reports - Creation and generation of reports referring to data already existing in the database. Refer to “On-Demand Reports” on page 202

8.2 Report Configuration

The configuration of reports (Settings > Reports), is available to admin users only.

8.2.1 Regular Reports

Report creation consists of the following steps:

- Defining the variables which will be the building blocks of the reports. Only measurements performed after defining them as variables will be available for the reports. Refer to Section 8.2.1.1.
- Sorting the created variables in various combinations into report views. Refer to Section 8.2.1.2.

8.2.1.1 Defining Report Variables

Reports are based on the system existing measurements.

To start defining report variables:

1 From the Settings menu select Reports > Report Variables; The Report Variable Configuration starting page contains a table showing the active (currently monitored) and inactive report variables. In a new system, the table contains the variables used for the predefined reports.

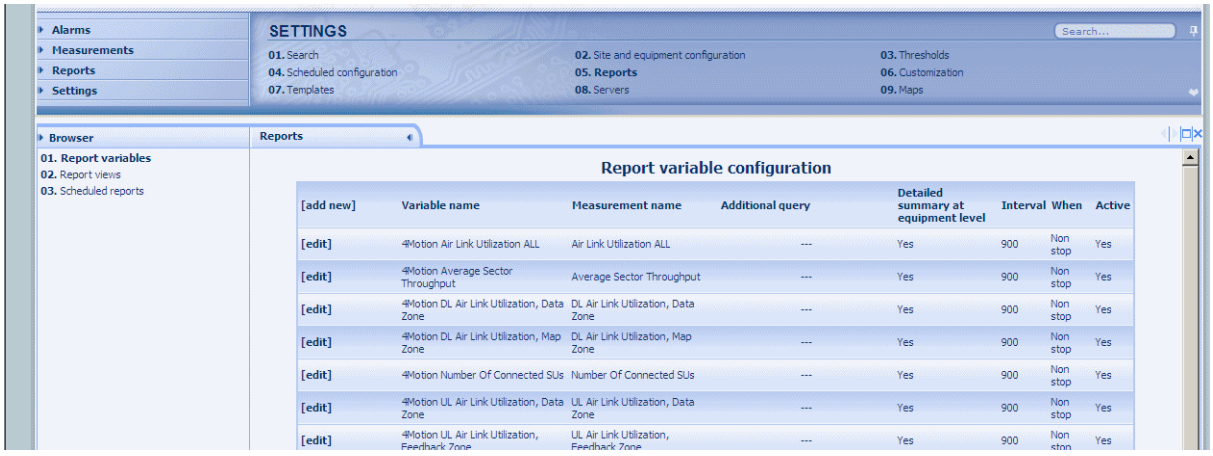


Figure 8-1: Report Variables Window (Example)

To create a report variable:

1 Click **[add new]**; the following window is displayed:

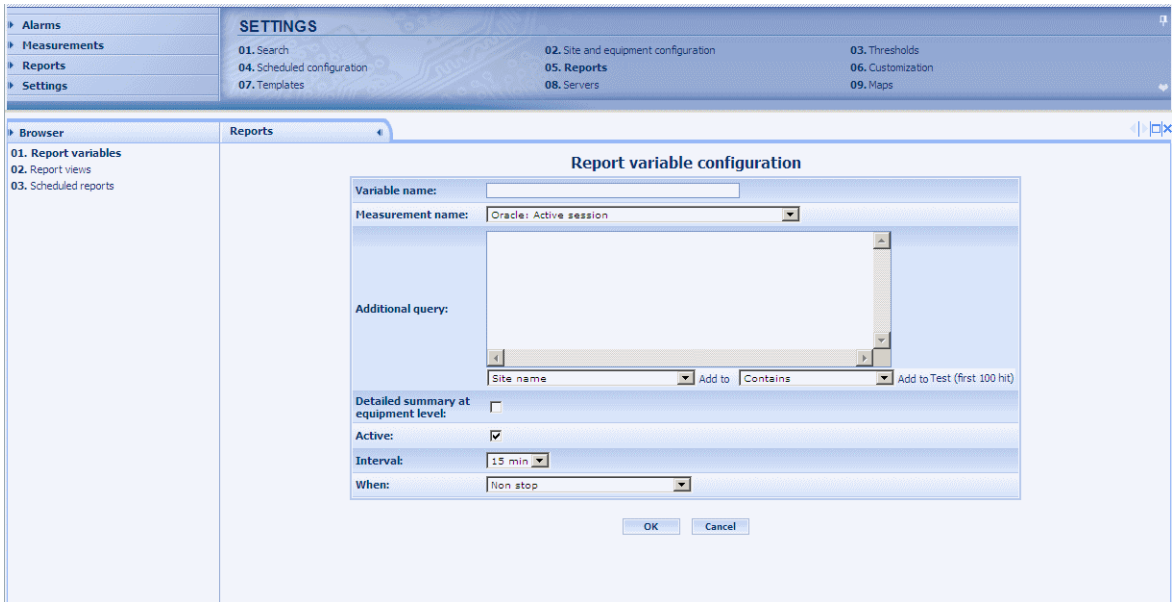


Figure 8-2: Adding a New Report Variable

2 Enter a unique and meaningful name for the variable. The name should reflect the device type as well as the measurement. For example: “TDD Utilization”.

3 Select a Measurement Name from the drop-down list. The list is based on measurements per collector/equipment type. Make sure to select the measurement from the correct collector.

4 Leave Detailed summary at equipment level unchecked.

5 Verify that the Active check-box is selected.

6 Leave the interval of 15min.

7 When: Select the required timeframe for collection from the drop-down menu or leave the value as “non stop”.

8 Click **OK**; the report variable is added to the list.

To edit an existing report variable:

1 Click **[edit]** next to the variable to be changed; the Report Variable Configuration window is displayed (see Figure 8-2).

2 Edit the variable name as required.

3 Select if to activate the variable calculation using the Active check-box.

4 Click **OK**; the report variable is updated in the list.

NOTE

- An active report variable consumes computer resources. Therefore, it is recommended to define only the required variables and deactivate redundant ones.
- The only way to disable a variable is to set it as inactive. You cannot delete a report variable.

8.2.1.2 Defining Report Views

Report view is the display method of the report variables.

Report views have three types: Table, TopN and Chart (not applicable). The first two are table-arranged report variables; The difference between TopN and Table reports is that for TopN reports it is impossible to navigate among the sites.

To Start Report View Configuration:

1 From the Settings menu select Reports > Report Views; The Report View Configuration starting page contains a table showing the active report views. On a new system, this table contains the predefined reports.

Alarms
Measurements
Reports
Settings
SETTINGS
01. Search
02. Site and equipment configuration
03. Thresholds
04. Scheduled configuration
05. Reports
06. Customization
07. Templates
08. Servers
09. Maps
Browser
01. Report variables
02. Report views
03. Scheduled reports
Reports
Report view configuration
[add new] [copy from]
Name
Type
Top level?
First hierarchy level
Result window
[edit] [del] [tables] 4Motion BottomN Uptime TopN Yes Measurements 10
[edit] [del] [tables] 4Motion TopN Air Link Utilization TopN Yes Measurements 10
[edit] [del] [tables] 4Motion TopN Average Sector Throughput TopN Yes Measurements 10
[edit] [del] [tables] 4Motion TopN Number Of Connected SUs TopN Yes Measurements 10
[edit] [del] [tables] 4Motion TopN Throughput TopN Yes Measurements 10
[edit] [del] [tables] FDD BottomN Uptime TopN Yes Measurements 10
[edit] [del] [tables] FDD TFTP BottomN Uptime TopN Yes Measurements 10
[edit] [del] [tables] FDD TFTP TopN Air Link Utilization TopN Yes Measurements 10
[edit] [del] [tables] FDD TFTP TopN Number Of Connected SUs TopN Yes Measurements 10
[edit] [del] [tables] FDD TFTP TopN Throughput TopN Yes Measurements 10
[edit] [del] [tables] FDD TopN Air Link Utilization TopN Yes Measurements 10
[edit] [del] [tables] FDD TopN Number Of Connected SUs TopN Yes Measurements 10
[edit] [del] [tables] FDD TopN Throughput TopN Yes Measurements 10
[edit] [del] [tables] TDD BottomN Uptime TopN Yes Measurements 10
[edit] [del] [tables] TDD TopN Air Link Utilization TopN Yes Measurements 10
[edit] [del] [tables] TDD TopN Number Of Connected SUs TopN Yes Measurements 10
[edit] [del] [tables] TDD TopN Throughput TopN Yes Measurements 10

Figure 8-3: Report View Configuration Window (example)

To create a new report view:

1. Click **[add new]**; a setting page is displayed (see Figure 8-4).
2. Enter a meaningful name (free text).
3. Select a type: Tabular or TopN.
4. Leave the Top Level? check-box selected.
5. Set the First Hierarchy Level to: measurements.
6. Set the result window size.
7. Click **OK**; The new view is added to the list of views.

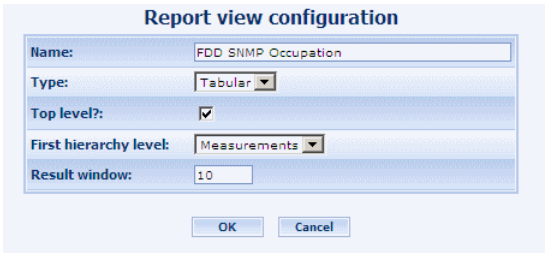


Figure 8-4: Creating a New Report View

8 In the Report View Configuration window (see Figure 8-3) click on the **[tables]** link. The configuration page is displayed (empty in a new report):

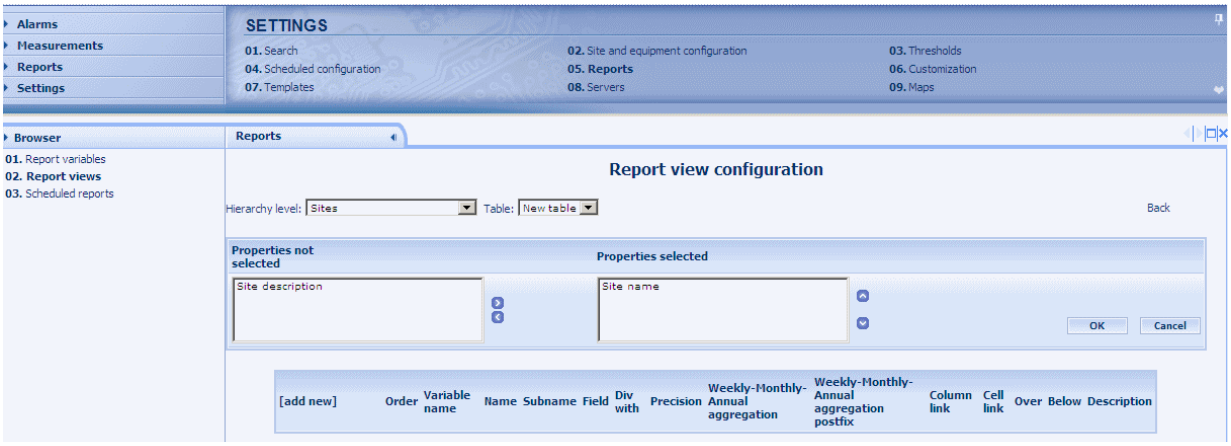


Figure 8-5: Configuration Page

9 In the upper section, select the hierarchy level: Additional Measurements.

10 Click **[add new]** to add variables to the report view. Add as many variables as necessary. The following window is displayed per each variable:

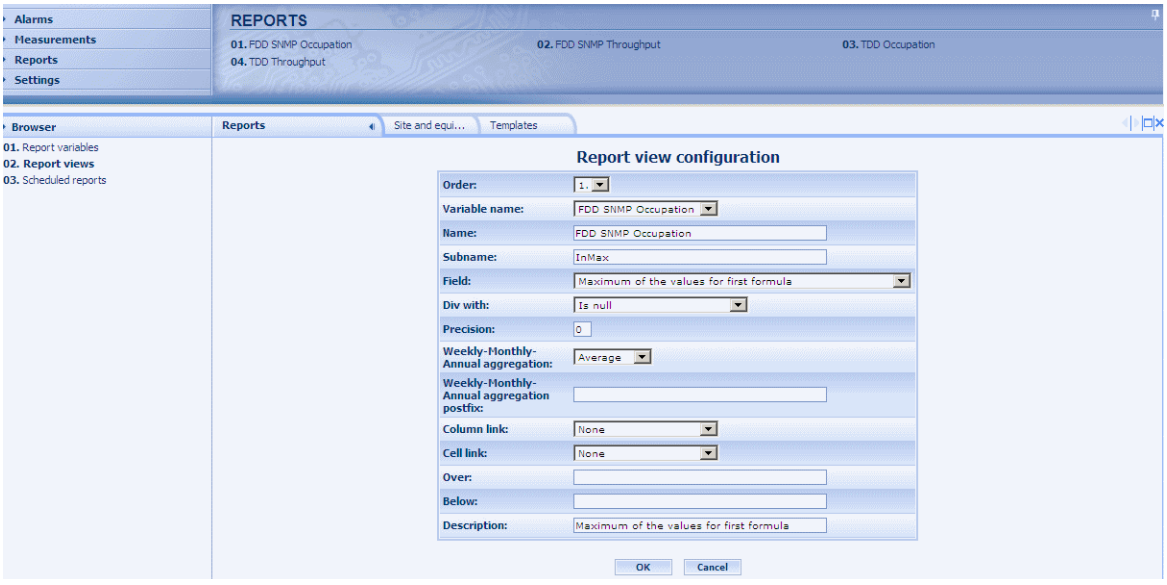


Figure 8-6: Adding a New Variable

11 Repeat for each variable:

a Set the order. Assign the same order to variables you want to group. Grouped variables share variable-.name and name; they differ by subname.

b Select a variable name from the drop-down list of your pre-defined variables (See “To create a report variable:” on page 197.)

c Enter a meaningful name for the order group.

NOTE

In cases it is applicable, the name should specify if the measurement is an uplink or downlink value.

d Enter a meaningful subname for the subcolumn; it is only visible on the report, if there are at least two grouped columns.

Example of grouping according to steps a - d:

- Common Measurement name: Utilization
- Common Name: Utilization Downlink
- Subname: Min. for one variable, Max. for the other

e From the Field drop-down list select the required field value. Make sure that the field matches the names given above.

NOTE

In applicable cases, ‘First formula’ always represents uplink; ‘Second formula’ represents downlink.

f Leave Div with ‘is null’. Leave the Precision value at 0.

g Set Weekly-monthly aggregation according to the value selected in the Field.

h Enter the Weekly-monthly-yearly summary postfix: The application appends this text to the name of the column if the field is specified and it is not a daily report.

i Leave all the next fields unedited.

j Click **OK**. The Report View Configuration page is displayed.

12 In the upper right side of the page, select the report order using the Order by Column drop-down list.

13 Click **Back** in the upper right corner to save changes and return to the report view list.

To edit an existing report view:

1 From Settings select Reports > Report Views.

2 Click **[tables]** next to the report view you want to edit.

3 In the upper section, select the hierarchy level: Additional Measurements.

4 Click **[add new]**, **[edit]** or **[delete]**.

To create a new report view based on an existing view:

1 Click **[copy from]**; a setting page is displayed. (see Figure 8-7).

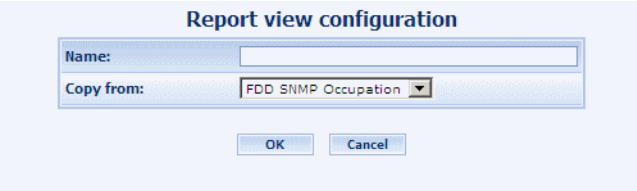


Figure 8-7: Creating a New Report View Using the Copy From Option

2 Enter a new name for the report view.

3 Select the report name to base the new report view from the drop-down list.

4 Click **OK**.

5 Edit the new report as described above.

8.2.2 On-Demand Reports

By using the On-demand reports the system creates and generates reports referring to data already existing in the database. It is recommended to specify limited amount of data for the report as processing large amounts of data causes system overload.

To create an On-Demand report:

1 From Reports select On Demand Reports; the On-demand selection path and settings window is displayed. The items in the selection path become available as you specify the settings:

Figure 8-8: On-demand Reports - Types

- In the Report Type section, choose either:
  - » By Equipment Level
  - » By Measurement. In this case, select wether to group measurements together.
- When: Which time period is used for the report

2 Click **Search** in the selection path; the Search settings window is displayed:

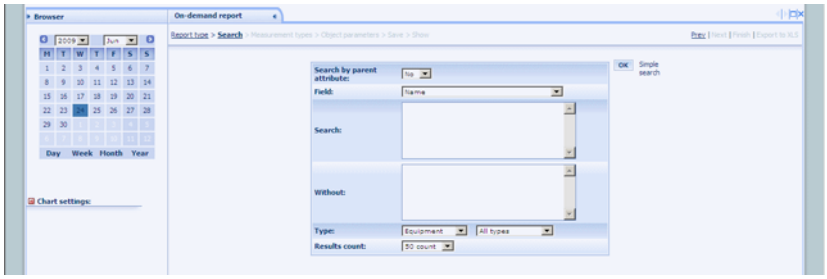


Figure 8-9: On-demand Reports - Search

3 Specify the Search:

- parent attribute:
  - » No - to search by equipment attribute
  - » Yes - to search by parent attribute
- Field: Leave “Name”
- Search - enter strings to be searched. All rules are applied as in “On Searching in General” on page 158.
- Without - enter strings to exclude from the search.
- Type: Equipments, choose a specific equipment type
- Select the number of requested results in the report.

NOTE

The message `Not all matching rows returned!` may appear at the bottom of the table if there are more results than selected counts.

4 Click **OK** at the top-right of the window; The list of results is displayed (Figure 8-10).

5 To narrow or improve the filtering, edit the title line and click **OK**. Repeat until the requested results are returned.

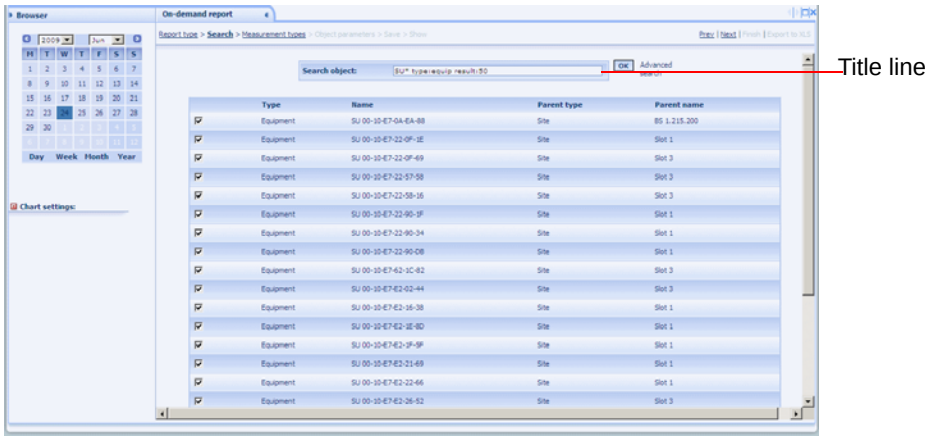


Figure 8-10: On-demand Reports - Measurement Types

6 Click **Measurement Types** in the selection path; a list of available measurement types and calculations is displayed:

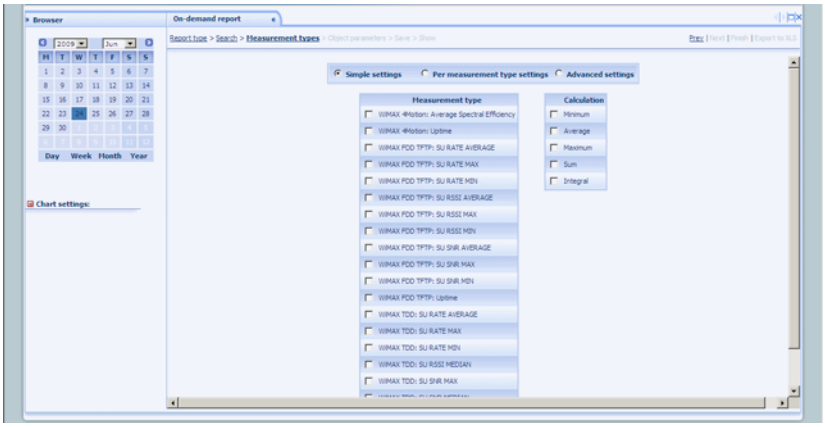


Figure 8-11: On-demand Reports - Measurement Types Settings

7 Select the measurement (s) at the left column, and the calculation (min., max. avg. etc) on the right column.

8 Click **Object Parameters** in the selection path; a list of parameters is displayed. These parameters will be the columns of the report. Some of the parameters are already selected.

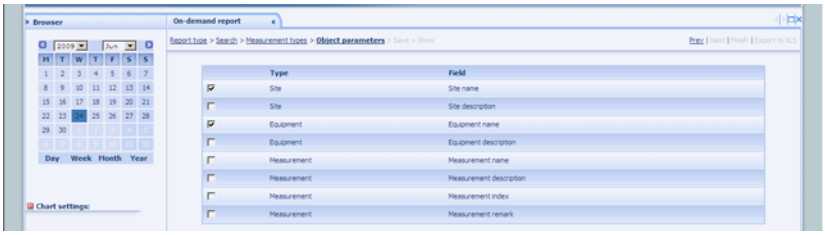


Figure 8-12: On-demand Reports - Object Parameters

9 Select the Measurement name check-box; the Show and Save options are enabled at the selection path.

10 Click **Save** to save the report settings (optional); the following window is displayed. Specify the report name and choose if to include the search settings

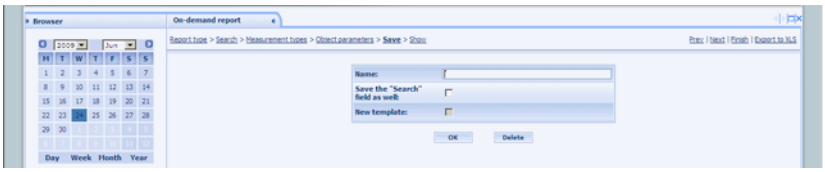


Figure 8-13: On-demand Reports - Save options

11 Click **Show** to display the report in a regular report format, including the option to specify time frame and export to **xls* format.

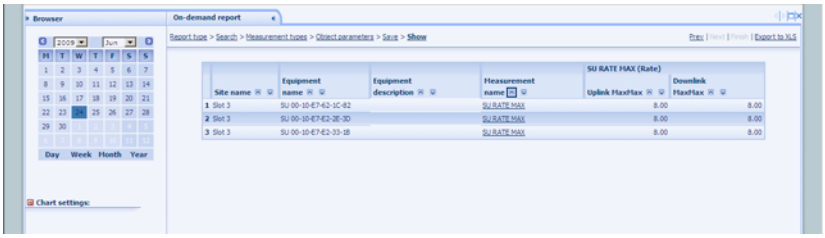

Browser
On-demand report
Report type > Search > Measurement types > Object parameters > Save > Show
Prev | Next | Finish | Export to XLS
Day Week Month Year
Chart settings:
Site name
Equipment name
Equipment description
Measurement name
SU RATE MAX (Rate)
Uplink MaxMax
Downlink MaxMax
1 Slot 3 SU 00-10-E7-E2-1C-B2 SU RATE MAX 8.00 8.00
2 Slot 3 SU 00-10-E7-E2-2E-3D SU RATE MAX 8.00 8.00
3 Slot 3 SU 00-10-E7-E2-33-1B SU RATE MAX 8.00 8.00

Figure 8-14: On-demand Reports - Show

8.3 Viewing Reports

The reports are displayed in the Reports viewing menu about an hour after defining the variables.

8.3.1 Navigating Report Views

Use the following buttons:

Table 8-1: Navigating Reports

Button/Link	Description
	Go to the first and previous page, respectively
	Go to the next and last page, respectively
	Page x out of total number of pages. Jump directly to the required page by entering its number in the text field and pressing the enter key.
	Up and down arrows for ordering all results on the given level. The current ordering is indicated by a blue rectangle around the selected arrow
Export current table to XLS	Exports the currently displayed entries to an XLS file.
Export all data to XLS	Exports the all the entries to an XLS file, including entries which are not currently displayed.
Filter	Filters entries by equipment name or measurement name. The rules for special characters are the same as for search (see "Search (Admin only)" on page 221)
	Entries with underline, serve as links, and jump to the specific equipment measurement, with the properly selected date and time interval.

8.3.2 Setting the Report Range and Display

While viewing the report results, the calendar at the Browser is used for setting the time interval of the report. The selected report view is displayed to the right of the calendar. You can also set what type of reports to view and whether to display the date in a column.

To use the calendar:

1 Click on the arrow buttons in the two top corners of the calendar to change the month. Alternatively, select a month and year using the drop-down menus (see Figure 8-15).

2 To change the type of time interval, click on the Day/Week/Month/Year text links at the bottom.

3 Select the actual time interval by clicking on one of the displayed days, months or years.

NOTE

Time intervals starting in the future cannot be selected with the calendar.

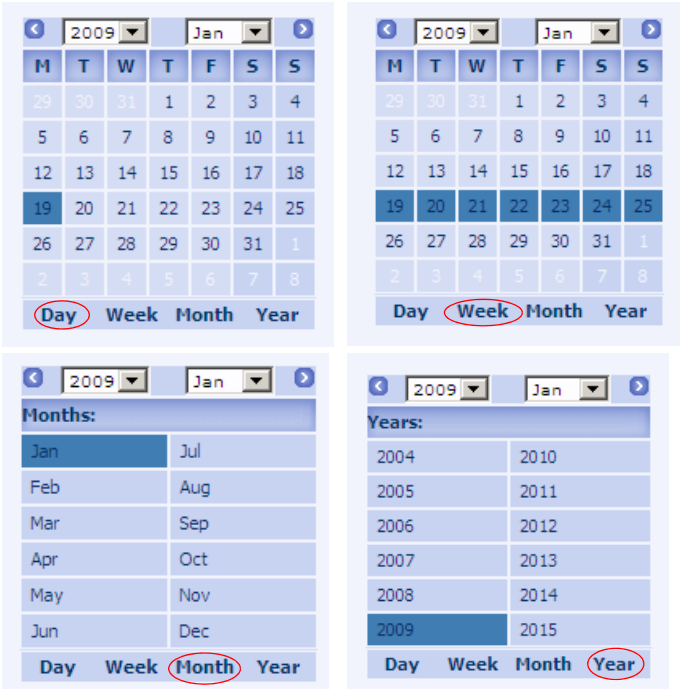


Figure 8-15: Calendar views (day, week, month and year) for selecting the time interval

To set report display options:

1 In the Settings area at the bottom of the Browser, select the type of report from the Type drop-down list:

- » Table only
- » Grouped
- » Separated
- » Sort by

2 Select the Show Date in Column option to display (if the report includes dates)

NOTE

These settings do not affect the export of reports to xls files

8.4 Bulk Export Wizard - Exporting Data to XLS Files

The Bulk Export is a wizard driven utility used for exporting data from the StarQuality database into *xls* files according to the following user defined cross sections:

- Timeframe: up to one week
- Network elements:
  - » Type: SU, AU or common BTS data (number of exported lines is limited to 65,000)
  - » Technology: FDD, FDD SNMP, TDD, 4Motion (Ver.2.5M and 3.0), VL, Extreme

  The system enables choosing specific elements from the list of NEs matching the above conditions.

The *xls* file can be viewed or saved on the client machine at any location.

To export AU or common BTS data:

1 From Reports select Bulk Export Wizard; The Bulk Export Wizard window is displayed.

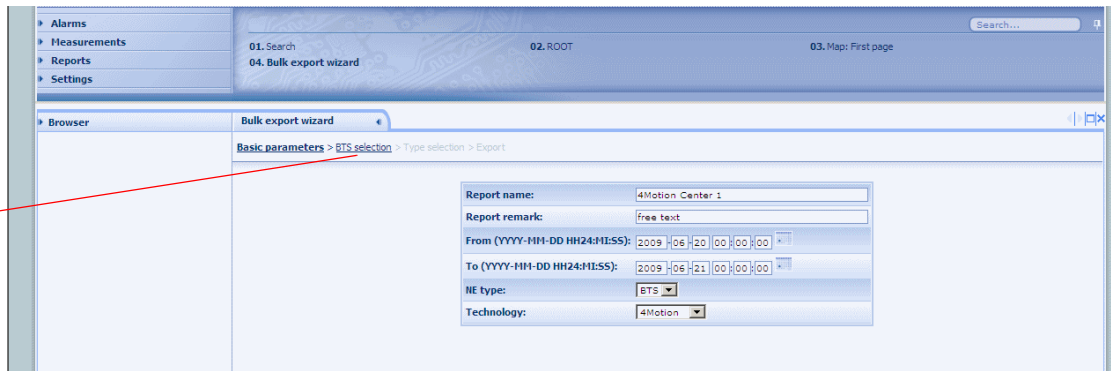


Figure 8-16: Bulk Export Wizard Window

2 Specify meaningful name and description (free text) to the report.

3 Select a time frame, using the input fields or the calendar button: Specify maximum one week. Longer type results in an error message when trying to proceed to the next stage.

NOTE

Seconds are ignored; minutes are regarded as the closest quarter of an hour

4 Select NE Type: BTS and any technology required.

5 Click **BTS Selection** in the path at the top of the work area (see Figure 8-16); the filtering criteria screen is displayed.

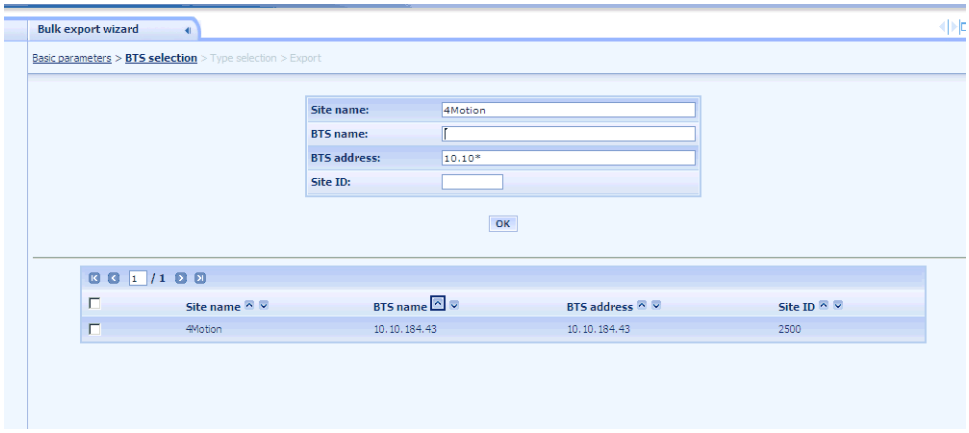


Figure 8-17: Bulk Export Wizard - Filtering Devices

6 Enter the following criteria. (All categories are optional; That is, if left empty, no filtering is performed. Also all input is according to the search rules described in "On Searching in General" on page 158):

- Site name
- BTS name
- BTS Address (IP)
- Site ID (as exists in the database)

7 Click **OK**; a list of network elements matching the filter criteria is displayed. You can repeat the filtering until getting the desired results.

8 Select the check-boxes of BTSs you wish to export data from, or use the topmost check box to select all the elements.

NOTE

The Select All check box refers only to the currently displayed page. For selecting all the results in all pages, select the checkbox separately on each page.

9 Click **Type Selection** in the selection path (Figure 8-16); the Exported Entity choice window is displayed.

- For AU/BS data select Logical BS measurements (default)
- For common BTS data select Common measurements

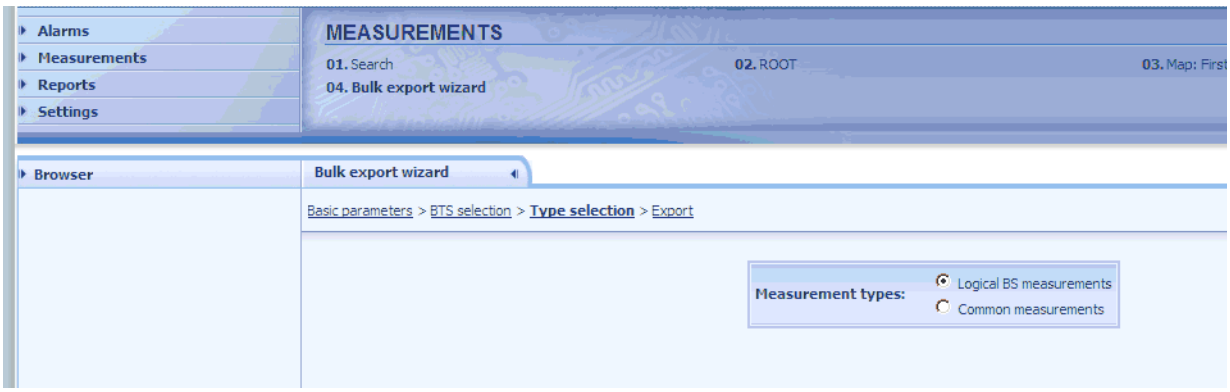


Figure 8-18: Exported Entity Selection

10 Click **Export** in the selection path (Figure 8-16). The following message is displayed:

Windows Internet Explorer
After clicking on the OK button, the application will start to generate the Excel file.
This might take several minutes, please do not navigate away and do not close your browser.
OK

Figure 8-19: Export Message

11 Click **OK**; In certain cases a second message is displayed informing that the data may exceed 66,000 lines. Click **OK**; A standard File Save/Download window is displayed.

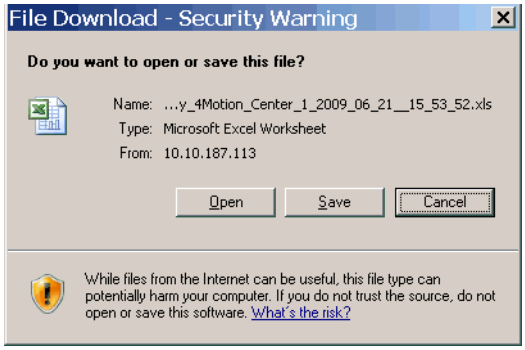

File Download - Security Warning
Do you want to open or save this file?
Name: ...y_4Motion_Center_1_2009_06_21__15_53_52.xls
Type: Microsoft Excel Worksheet
From: 10.10.187.113
Open
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not open or save this software. What's the risk?

Figure 8-20: File Download

The default file naming format is: *StarQuality<Report Name><Date><Time>*. Report name is defined in Step 2.

Report name:	4Motion Center 1			**Generation date:**	2009.06.21. 15:53:52			
Report type:	BTS			**Created by:**	Administrator			
Collection date from:	2009.06.20. 00:00:00			**Remark:**	free text			
Collection date to:	2009.06.21. 00:00:00			**Number of NE:**	1			
Excel truncated:	No			**Granularity level:**	15 Minutes			
Timestamp	**BTS name**	**BS**	**Air Link Utilization ALL**	**Average Sector Throughput Uplink**	**Average Sector Throughput Downlink**	**Average Spectral Efficiency all MSs Uplink**	**Average Spectral Efficiency all MSs Downlink**	
2009.06.20. 00:15:00	10.10.184.43	BS 9.9.9	5.4	2623.0	11586.0	0.0	0.0	
2009.06.20. 00:30:00	10.10.184.43	BS 9.9.9	5.4	2540.0	11657.0	0.0	0.0	
2009.06.20. 00:45:00	10.10.184.43	BS 9.9.9	5.4	2618.0	11688.0	0.0	0.0	
2009.06.20. 01:00:00	10.10.184.43	BS 9.9.9	5.4	2523.0	11680.0	0.0	0.0	
2009.06.20. 01:15:00	10.10.184.43	BS 9.9.9	5.4	2594.0	11651.0	0.0	0.0	
2009.06.20. 01:30:00	10.10.184.43	BS 9.9.9	5.4	2560.0	11666.0	0.0	0.0	
2009.06.20. 01:45:00	10.10.184.43	BS 9.9.9	5.4	2598.0	11588.0	0.0	0.0	
2009.06.20. 02:00:00	10.10.184.43	BS 9.9.9	5.4	2559.0	11715.0	0.0	0.0	
2009.06.20. 02:15:00	10.10.184.43	BS 9.9.9	5.4	2617.0	11583.0	0.0	0.0	
2009.06.20. 02:30:00	10.10.184.43	BS 9.9.9	5.4	2571.0	11660.0	0.0	0.0	
2009.06.20. 02:45:00	10.10.184.43	BS 9.9.9	5.4	2585.0	11719.0	0.0	0.0	
2009.06.20. 03:00:00	10.10.184.43	BS 9.9.9	5.4	2557.0	11680.0	0.0	0.0	
2009.06.20. 03:15:00	10.10.184.43	BS 9.9.9	5.4	2603.0	11629.0	0.0	0.0	
2009.06.20. 03:30:00	10.10.184.43	BS 9.9.9	5.4	2556.0	11641.0	0.0	0.0	
2009.06.20. 03:45:00	10.10.184.43	BS 9.9.9	5.4	2582.0	11585.0	0.0	0.0	
2009.06.20. 04:00:00	10.10.184.43	BS 9.9.9	5.4	2562.0	11624.0	0.0	0.0	
2009.06.20. 04:15:00	10.10.184.43	BS 9.9.9	5.4	2623.0	11671.0	0.0	0.0	
2009.06.20. 04:30:00	10.10.184.43	BS 9.9.9	5.4	2648.0	11766.0	0.0	0.0	
2009.06.20. 04:45:00	10.10.184.43	BS 9.9.9	5.4	2628.0	11584.0	0.0	0.0	
2009.06.20. 05:00:00	10.10.184.43	BS 9.9.9	5.4	2999.0	11660.0	0.0	0.0	
2009.06.20. 05:15:00	10.10.184.43	BS 9.9.9	5.4	2751.0	11672.0	0.0	0.0	
2009.06.20. 05:30:00	10.10.184.43	BS 9.9.9	5.4	3211.0	11586.0	0.0	0.0	
2009.06.20. 05:45:00	10.10.184.43	BS 9.9.9	5.4	3166.0	11650.0	0.0	0.0	
2009.06.20. 06:00:00	10.10.184.43	BS 9.9.9	5.4	3133.0	11632.0	0.0	0.0	
2009.06.20. 06:15:00	10.10.184.43	BS 9.9.9	5.4	3212.0	11734.0	0.0	0.0	
2009.06.20. 06:30:00	10.10.184.43	BS 9.9.9	5.4	3170.0	11619.0	0.0	0.0	

Figure 8-21: Sample xls File

To export SU data:

1 From Reports select **Bulk Export Wizard**; The Bulk Export Wizard window is displayed (see Figure 8-16).

2 Specify meaningful name and description (free text).

3 Select a time frame, using the input fields or the calendar button: Specify maximum one week. Longer type results in an error message when trying to proceed to the next stage.

NOTE

Seconds are ignored; minutes are regarded as the closest quarter of an hour.

4 Select NE Type: SU, and any technology required.

5 Click **BTS Selection** in the path at the top of the work area (see Figure 8-16); the filtering criteria screen is displayed (see Figure 8-17).

6 Enter the following criteria. (All categories are optional, which means if left empty, no filtering is performed. Also all input is according to the search rules described in "On Searching in General" on page 158):

- Site name
- BTS name
- BTS Address (IP)
- Site ID (as exists in the database)

7 Click **OK**; a list of network elements matching the filter criteria is displayed (see Figure 8-17). You can repeat the filtering until getting the desired results.

8 Select the check-boxes of BTSs you wish to export data from, or use the topmost check-box to select all the BTSs.

9 Click **Sector Selection** in the selection path (see Figure 8-16); A list of all the sectors belonging to the BTSs chosen in Step 8 is displayed.

10 Click **SU Selection** in the selection path; A list of all the SUs belonging to the sectors chosen in Step 9 is displayed.

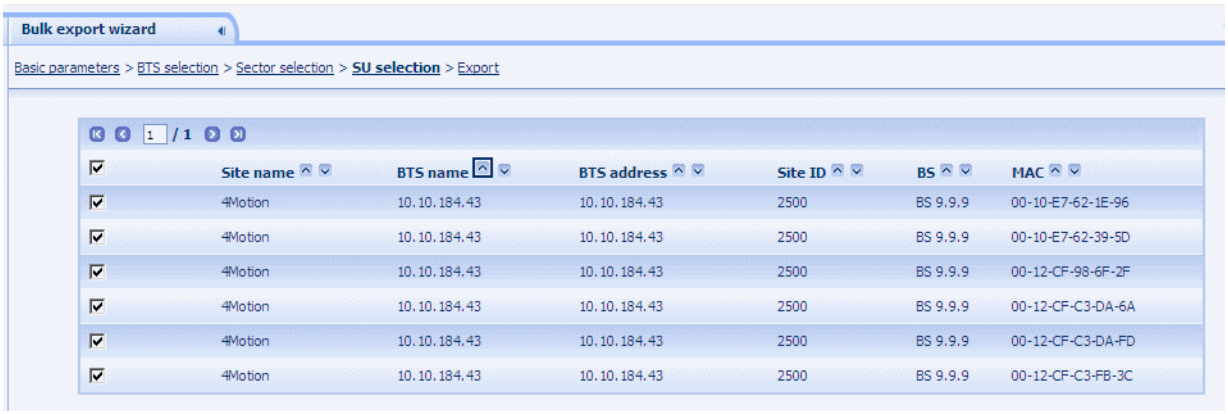


Figure 8-22: SU Selection

NOTE

For Steps 8 through 10, the Select All check box refers only to the currently displayed page. For selecting all the results in all pages, select the checkbox separately on each page.

11 Click **Export** in the selection path. The following message is displayed.

Windows Internet Explorer
After clicking on the OK button, the application will start to generate the Excel file.
This might take several minutes, please do not navigate away and do not close your browser.
OK

Figure 8-23: Export Message

12 Click **OK**; In certain cases a second message is displayed informing that the data may exceed 66,000 lines. Click **OK**; A standard File Save/Download window is displayed.

The default file naming format is: *StarQuality<Report Name><Date><Time>*. Report name is defined in Step 2.

Chapter 9

General Setting Options

In this chapter:

- “Overview” on page 218
- “Search (Admin only)” on page 221
- “Site and Equipment Configuration” on page 222
- “Customization” on page 233
- “Templates (admin only)” on page 245
- “Server Configuration and Management (Admin only)” on page 246
- “Audit Trail” on page 258
- “User Administration (Admin only)” on page 261

9.1 Overview

The Settings item in the main menu contains many options for changing the StarQuality configuration. For each item in the submenu panel, different items appear in the Browser. For non-administrator users, the submenus used to make changes are not displayed, and the other submenus are displayed selectively based on the access rights of the user.

This chapter describes some general setting options available in the StarQuality application. These settings are:

- **Search** - Setting the searching parameters
- **Customization** - editing of “public” objects refers to the administrator users, while editing of “private” objects refers to the rest of the users
  - Public/Private charts: Configuring charts
  - Public/Private menu items: Defining menu items for the submenu panel
  - External links (admin only): Setting the external links to display for basic or virtual site and equipment objects
  - Preferences (non-administrator users only): Configuring displaying preferences
  - E-mail addresses: A list of the e-mail addresses of the users

- **Servers**
  - Licences: Displaying and configuring the currently used and available licences
  - Device and measurement summary: Viewing the list of all basic equipments, and the number of objects in the system for each measurement type
  - Server groups: Configuration of individual measuring groups
  - Server configuration: Modifying the measurement servers and other servers
  - Start/Stop/Status: Remote management of individual servers
  - Server events: Viewing the events that occurred during self-testing
  - Collector load: Viewing the load of the collectors and listing the unsuccessful measurements at a given date.
- **Maps** (admin only): Not applicable
- **Audit Trail** (admin only): Displaying the individual configuration modifications
- **User**
  - User admin (admin only): Adding, deleting and modifying users
  - User rights (admin only): Configuring which privileges/permissions the users should possess
  - Password: Changing password

Other settings that are directly involved with the main system functionality are described in the relevant chapters. Such settings appear in the following list of menu items in the Settings section, with a reference to the exact location of their description:

- **Site and equipment configuration** - also in Chapter 3, “Getting Started” on page 106

- **Scheduled configuration** (admin only) - Automatically scheduled configurations - in Chapter 3, “Getting Started” on page 106
- **Thresholds** - in Chapter 7, “Threshold-Crossing Alarms Monitoring” on page 182
- **Reports** (admin only)- in Chapter 8, “Reports” on page 193
  - » Report variables: Defining the variables used for reports
  - » Report views: Creating reports by selecting variables
  - » Scheduled reports: Setting scheduled report delivering
- **Templates** - in Chapter 6, “Setting Alarm Thresholds” on page 165

9.2 Search (Admin only)

Searching is done only by names of sites and equipment.

Under the Settings > Search menu item you can search the stored objects in the system. This menu is only accessible to the administrator and restricted administrator users.

To start searching for an object:

Specify a searching string, using one of the following methods:

1. Simple search: type the string directly in the input field, and click **OK**.
2. Click **Advanced Search**; an advanced window is displayed, which facilitates the construction of the searching string and contains the following insert fields:
   a. **Search to parent name (Yes/No):** If you select “yes” the search finds those objects whose parent name meets the conditions (e.g. the parent is the containing site for a piece of equipment).
   b. **Name:** name of the object to be searched. The _ and ? characters match an arbitrary single letter, while % and * match an arbitrary string. The expressions in separate lines will be in OR relation with each other.
   c. **Without:** characters to be ignored by the system (the format is the same as above)
   d. **Type:** the type of the object to be searched. Subtype can also be given for equipment, equipment template and measurement type.
   e. **Results count:** maximum number of results
3. Click **OK**; The results are displayed as well as the searching string as it could be given at simple search.

9.3 Site and Equipment Configuration

The following topics are covered in this section:

- "Object Hierarchy Overview" on page 222
- "Site and Equipment Configuration" on page 224
- "Equipment Configuration" on page 226
- "Creating and Editing Virtual Equipment" on page 230
- "Linked Equipment" on page 232

9.3.1 Object Hierarchy Overview

9.3.1.1 Non-virtual Objects

There are three non-virtual object types in the system obeying the following three rules:

- **Sites:** Each site has a name and an optional descriptive text. Each site can contain arbitrary many sites and equipments. Each site may reside below another site, and this relation can be modified during the existence of the site. The initial site (ROOT) is an exception to this rule and can only contain sites and cannot be modified or deleted. The name of the site has to be unique only inside the site containing it, although it is recommended to keep it globally unique.

- **Equipment:** Each piece of equipment belongs to a site. This relation can be modified during the existence of the equipment. The name of the equipment has to be unique in the whole system globally.

- **Measurements:** The equipments contain the measurements which cannot be moved to another piece of equipment.

9.3.1.2 Virtual Objects

In the StarQuality system the administrator and the restricted administrator users can create sites, equipments and measurements. These items are immediately available for authorized users too: they appear under for example the Measurements menu item, where the individual elements are displayed in the

same division and in the same way as the administrators have specified during creation.

This initial hierarchy and its objects are called basic or normal objects. Parallel to this structure both administrators and normal users can develop their own structures; moreover, administrators can create public structures as well. Each level of the basic hierarchy has its parallel equivalent:

- Virtual site: corresponds to a site object; can be placed under any basic or virtual site, and can contain virtual sites, virtual equipment and linked basic equipments
- Virtual equipment: corresponds to an equipment object; can be placed under any basic or virtual site, and can contain measurements and private/public charts
- Private/public charts: correspond to the measurement object; in contrast to that, however, it can contain not only one or two measurement values but also arbitrary measurements and report summaries of an arbitrary piece of equipment. It can be placed under virtual equipments manually. It can automatically appear under basic equipment too if it contains a measurement running on the given equipment or a report summary for that equipment

This parallel structure is used, according to the settings under the Preferences menu item, for the display of both measurements and thresholds filtered by site or equipment. Contrary to this, for the Reports menu item one can move along only the basic hierarchy.

Virtual sites and equipments can be private or public objects:

- Administrator users can create both types
- Admin users can only create public objects,
- Other users can only create private objects
- Restricted administrators can modify a public object if they created it.
- The configuration follows the same principles and there is only one restriction: only public virtual sites, equipments and measurements can be placed under public virtual sites, while only the private ones under private virtual sites.

9.3.2 Site and Equipment Configuration

The administration of the (basic and virtual) sites, (basic and virtual) equipments and measurements is performed under the 'Site and equipment' menu item (Settings > Site and equipment configuration). You can also configure threshold settings (limited to measurement thresholds on a single equipment only, otherwise use the Settings > Threshold menu item, see "Customization" on page 233), and charts (of measurements from the same equipment in the hierarchy only, otherwise use the Settings > Customization > Public Charts (admin only) or Private Charts menu items).

- In the Site and Equipment Configuration the path showing the actual location within the hierarchy appears at the top of the page, and stay visible even if the page is scrolled (see Figure 9-1). To return to a higher hierarchy level, click on the elements of the list, except the last one.

NOTE

If you navigate to an equipment through one of its virtual sites, then after any equipment modification you cannot return to that point in the virtual hierarchy, since the application modifies the current location according to the normal hierarchy, i.e. it will show the equipment under its parent site.

9.3.2.1 Operations Drop-Down Menu Options

- The following functions are available for viewing site data (see Figure 9-1):
  - **Go to measurements** and **Go to alarms** - jump to these main menu items by keeping the selected hierarchy item.
  - **Modify equipment**, **Modify equipment without discovery**, **Deactivate data collection** - For non-virtual equipment, accessing different

equipment modification modes (see "Equipment Modification" on page 227).

- **New threshold**, **New group threshold**, **New threshold from template** - For non-virtual equipment, accessing the threshold configuration pages (refer to "Setting Alarm Thresholds" on page 165).
- **Edit public charts** - For non-virtual equipment, accessing and private or public chart template configuration pages (see "Configuring Public and Private Charts" on page 238)
- **WiMAX inventory report** - Displays a table of all the CPEs in the site, from a single BTS to the whole network. The information includes BTS no., BTS name (by StarQuality), Serving BS, and CPE MAC address.

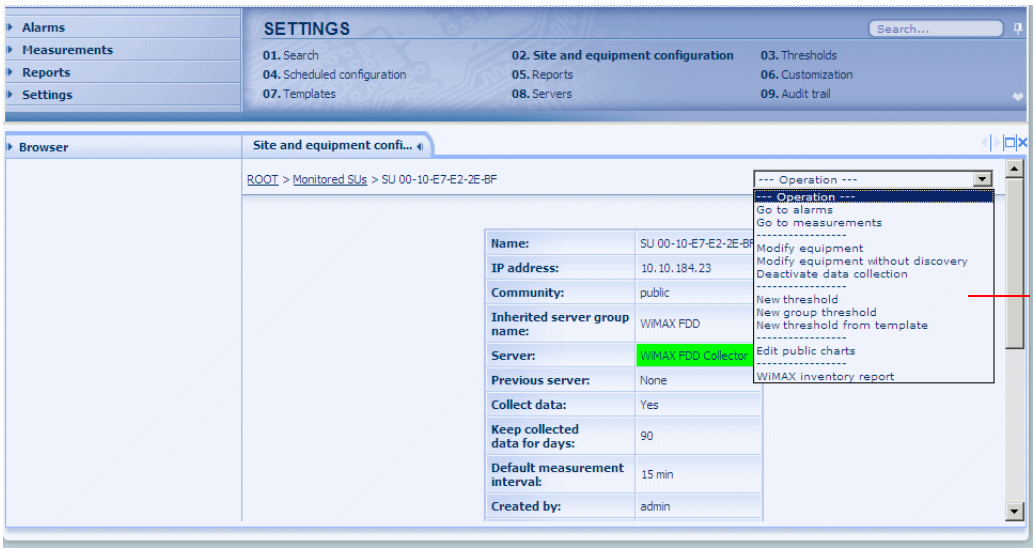


Figure 9-1: Site and Equipment Configuration Window with Operations Drop-down Menu

9.3.2.2 Adding and Editing Sites

You can create objects by selecting the kind of object from the scroll down menu in the table header under the basic or virtual site (see Figure 9-2).

To add or edit a site:

1. Select Settings > Site and Equipment Configuration.
2. Select the site that should contain the new one, then from the Creating drop-down menu select New Site.

3 Fill in the site name, its description and choose the corresponding icon and server group. Click **OK**.

4 To modify a site, click either **[edit]** or **[del]**) next to the site. Only empty sites can be deleted.

Figure 9-2: Adding a New Site

9.3.2.3 Creating and Editing Virtual Sites

The creation and editing of virtual sites is performed similarly to non-virtual sites (See above). When adding a virtual site, select the New public or New private site item from the pull down menu. The main difference is that under virtual sites, basic sites or equipment cannot be created (the latter can be only linked), therefore no server groups can be specified.

9.3.3 Equipment Configuration

9.3.3.1 Creating New Equipment from Template

The only templates available are either those not assigned to any site (general templates), or templates that are assigned to the current site (specific templates). If there is more than one available template, you choose the proper one. Then the system orders the templates so that the ones belonging to the data collector type of the current site are listed at the beginning.

Refer to “Discovery of WiMAX Devices” on page 125.

9.3.3.2 Equipment Modification

To modify a piece of equipment:

Use one of the following methods for equipment modification:

- Equipment Modification in Settings:

  a Click **[Edit]** next to the equipment name, or click the equipment icon and select Modify Equuipment from the Operations pull down menu; the system rediscovers the list of measurements that can be carried out on the equipment. The following notice appears on the page:

Figure 9-3: Equipment Discovery Message

The following page is displayed:

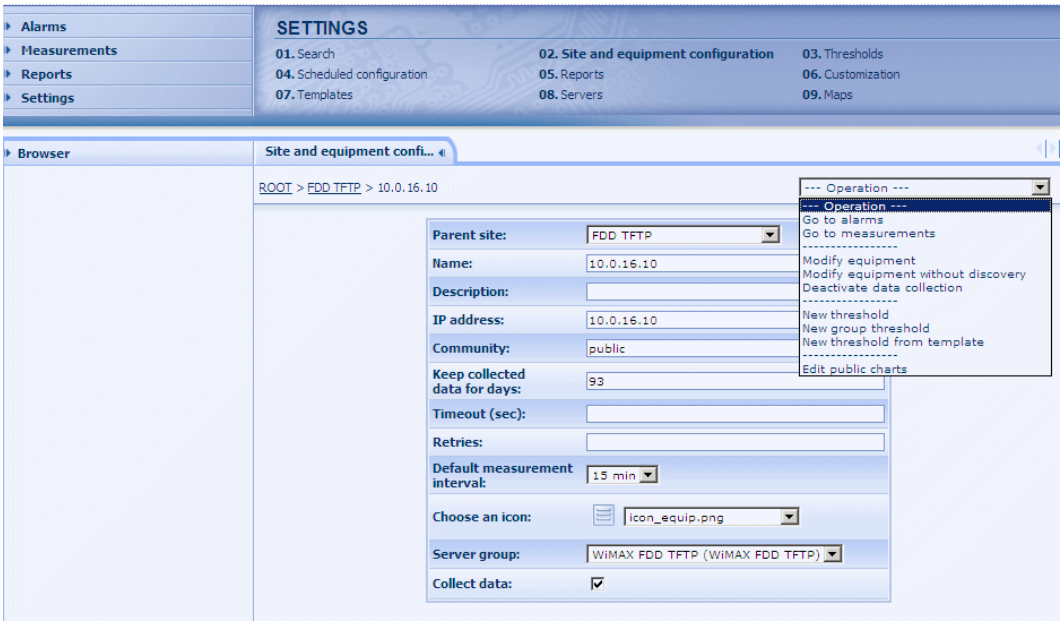


Figure 9-4: Equipment Modification Window

b Modify each parameter and click **OK**; The equipment configuration page is displayed.

- Equipment modification from the site:

  when viewing sites, use the **[edit]** link in the equipment lines, or select Modify Equipment from the Operations pull down menu to display the same page as in the previous item with the only difference that after the modification the system returns to the site page.

- Equipment modification without discovery:

  During Equipment Modification, only the equipment parameters are modified, and not measurements. Accordingly, the StarQuality does not carry out the equipment discovery, and consequently the modifications can be performed faster, provided you modify equipment parameters only

- Activating/deactivating data collection:

  In the Operations pull down menu, either Activate or Deactivate data collection appears, depending on the equipment status. The turning on and off Data Collection operations corresponds to the setting and clearing of the “Collect data” check-box in Equipment Modification page (see Figure 9-4). After turning off the data collection, the StarQuality does not collect data from the equipment until the switch is turned back, but it does not delete the equipment either. Therefore, the equipment is displayed similarly to other equipment under the Measurements and Alarms menu items, and its threshold and charts definitions are also retained.

9.3.3.3 Viewing the Equipment Configuration

To view the equipment configuration, click on the icon of the equipment in the list; a page with similar structure is displayed, with the following differences:

- Only the active measurements are displayed, and they cannot be modified

- On this page the threshold settings related to the equipment is displayed, which can also be modified from here.

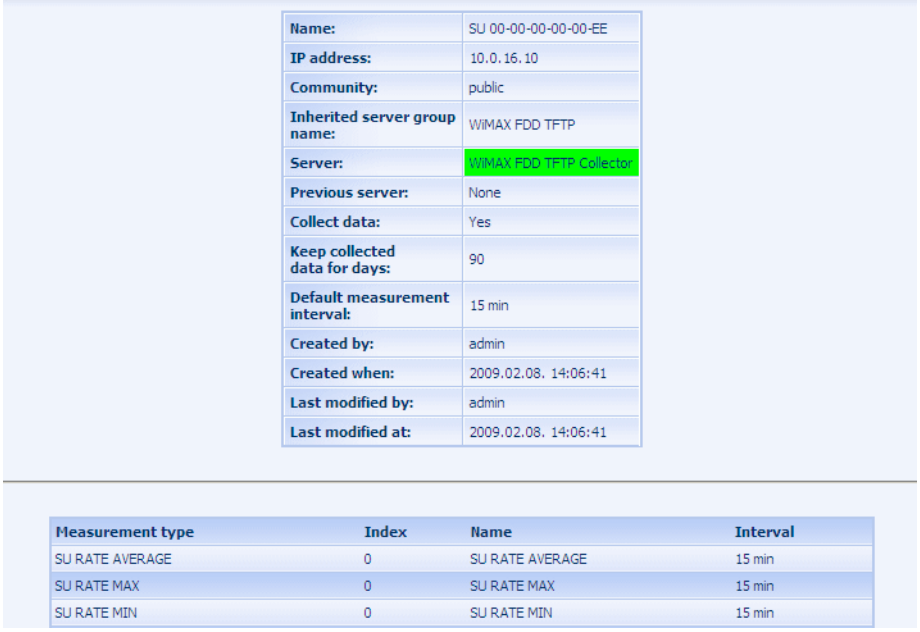

Name: SU 00-00-00-00-00-EE
IP address: 10.0.16.10
Community: public
Inherited server group name: WiMAX FDD TFTP
Server: WiMAX FDD TFTP Collector
Previous server: None
Collect data: Yes
Keep collected data for days: 90
Default measurement interval: 15 min
Created by: admin
Created when: 2009.02.08. 14:06:41
Last modified by: admin
Last modified at: 2009.02.08. 14:06:41
Measurement type Index Name Interval
SU RATE AVERAGE 0 SU RATE AVERAGE 15 min
SU RATE MAX 0 SU RATE MAX 15 min
SU RATE MIN 0 SU RATE MIN 15 min

Figure 9-5: Viewing Equipment with Additional Equipment Parameters

9.3.3.4 Equipment Deletion

You can delete equipments even if measurements belong to them. The deleted equipments, measurements and measurement results will be deleted from the active tables and placed into the archive tables.

The deletion function differs from the equipment deactivation function: for the former one, the measurements can be restarted for the equipment only if they are recreated, and so the thresholds definitions and the public and private charts have to be recreated again. In equipment deactivation, however, the data collection is suspended for the equipment, but nothing is deleted.

9.3.3.5 Threshold Modification for Equipment

Use the Operations pull-down menu to modify thresholds specifically for the selected equipment.

Refer to “Customization” on page 233.

9.3.3.6 Editing Charts for Equipment

Use the Operations pull down menu to modify charts specifically for the selected equipment, or scroll down to the threshold menu at the bottom of the page.

Refer to “Configuring Public and Private Charts” on page 238.

9.3.4 Creating and Editing Virtual Equipment

When creating a virtual equipment, you specify only the name and an optional description. After the creation, the virtual equipment can also be modified.

A newly created virtual equipment has a single parent object (with the current site), but later it can be placed under other sites as well. Accordingly, the parent site is a pull down menu suitable for choosing more elements, where the order in which the elements are displayed depends primarily on whether they have been selected to the equipment before.

To create a new virtual equipment:

1. In *Settings* > *Site and Equipment Configuration* select the site to which to add a new virtual equipment by clicking on its icon (you can also add virtual equipment directly to the ROOT).
2. From the Creating pull-down menu select New Public (admin only) or Private Virtual Equipment.
3. Specify the name and an optional description.

To modify a virtual equipment:

Use the following methods to modify:

- Basic parameters: Click **[edit]** next to the virtual equipment entry and modify the name and description as required. You can also modify the parent basic and virtual sites, using the parent site pull down menu.

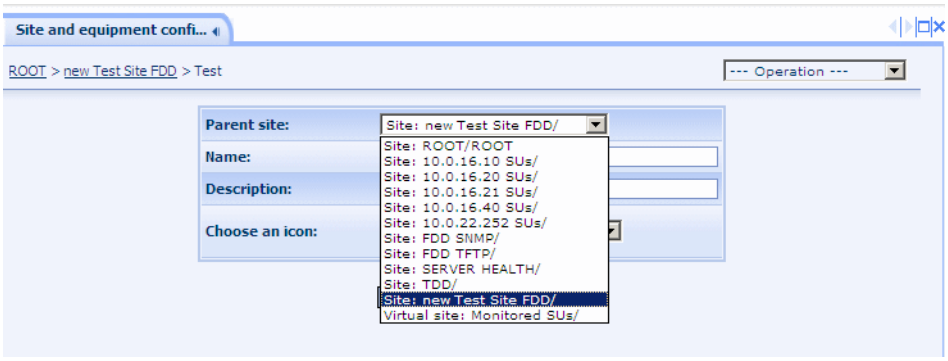


Figure 9-6: Virtual Equipment Modification I

- Assigning measurements and charts:

  a Click on the equipment icon.

  b Select either **[add new]** to add charts or measurements, or **[del]** to delete the equipment.

  c To choose a measurement to assign, specify reqired equipment parameters (see Figure 9-7).

  Use the symbols [%] and [_] to match an arbitrary substring or character, respectively. The search results are displayed in a list, where you can select parameters for the creation by setting or clearing the check-boxes in the lines, or changing the state of all check-boxes together with the check-box in the first line (see Figure 9-8).

  d To chose a chart to assign, specify its name. The searching method described above is similar for this step.

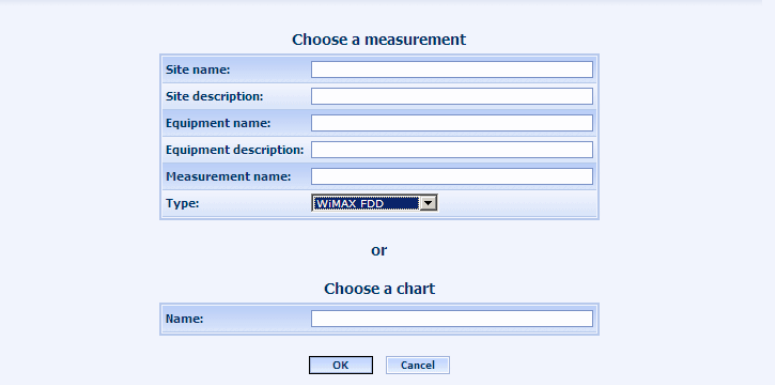


Figure 9-7: Virtual Equipment Modification II

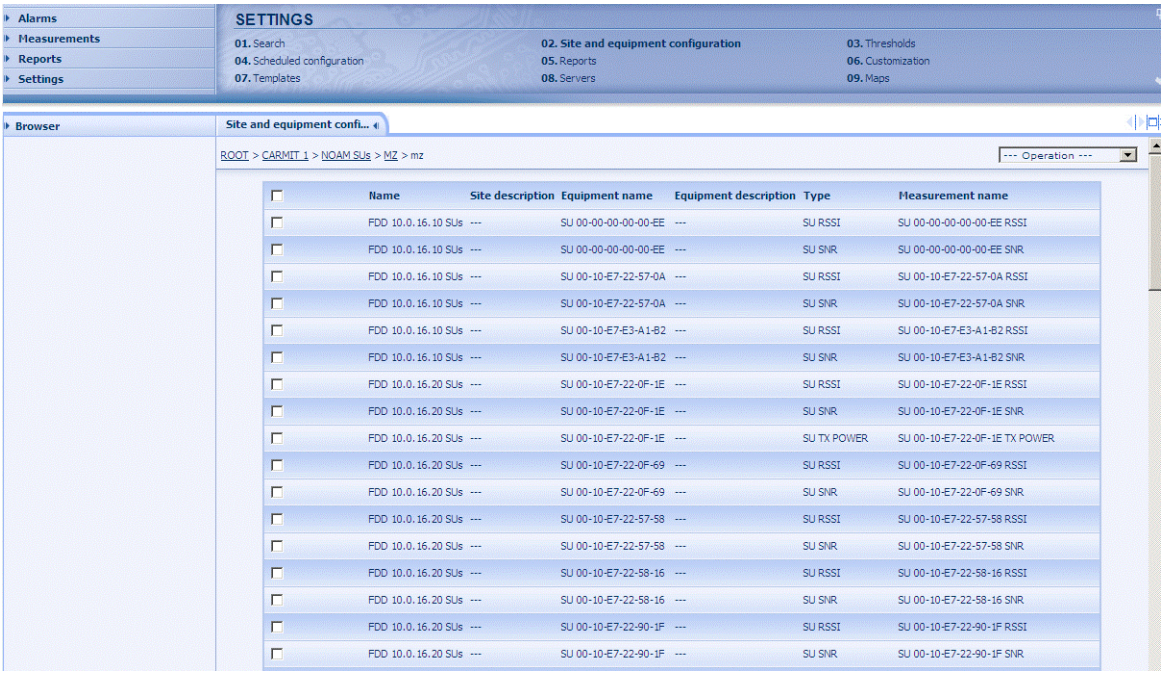

Alarms
Measurements
Reports
Settings
SETTINGS
01. Search
02. Site and equipment configuration
03. Thresholds
04. Scheduled configuration
05. Reports
06. Customization
07. Templates
08. Servers
09. Maps
Browser
Site and equipment confi...
ROOT > CARMIT 1 > NOAM SUs > MZ > mz
--- Operation ---
Name
Site description
Equipment name
Equipment description
Type
Measurement name
FDD 10.0.16.10 SUs --- SU 00-00-00-00-00-EE --- SU RSSI SU 00-00-00-00-00-EE RSSI
FDD 10.0.16.10 SUs --- SU 00-00-00-00-00-EE --- SU SNR SU 00-00-00-00-00-EE SNR
FDD 10.0.16.10 SUs --- SU 00-10-E7-22-57-0A --- SU RSSI SU 00-10-E7-22-57-0A RSSI
FDD 10.0.16.10 SUs --- SU 00-10-E7-22-57-0A --- SU SNR SU 00-10-E7-22-57-0A SNR
FDD 10.0.16.10 SUs --- SU 00-10-E7-E3-A1-B2 --- SU RSSI SU 00-10-E7-E3-A1-B2 RSSI
FDD 10.0.16.10 SUs --- SU 00-10-E7-E3-A1-B2 --- SU SNR SU 00-10-E7-E3-A1-B2 SNR
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-0F-1E --- SU RSSI SU 00-10-E7-22-0F-1E RSSI
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-0F-1E --- SU SNR SU 00-10-E7-22-0F-1E SNR
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-0F-1E --- SU TX POWER SU 00-10-E7-22-0F-1E TX POWER
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-0F-69 --- SU RSSI SU 00-10-E7-22-0F-69 RSSI
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-0F-69 --- SU SNR SU 00-10-E7-22-0F-69 SNR
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-57-58 --- SU RSSI SU 00-10-E7-22-57-58 RSSI
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-57-58 --- SU SNR SU 00-10-E7-22-57-58 SNR
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-58-16 --- SU RSSI SU 00-10-E7-22-58-16 RSSI
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-58-16 --- SU SNR SU 00-10-E7-22-58-16 SNR
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-90-1F --- SU RSSI SU 00-10-E7-22-90-1F RSSI
FDD 10.0.16.20 SUs --- SU 00-10-E7-22-90-1F --- SU SNR SU 00-10-E7-22-90-1F SNR

Figure 9-8: Virtual Equipment Modification - Site Search Results

9.3.5 Linked Equipment

Under the virtual sites you cannot insert or delete equipment, but you can link the already inserted equipment or remove an existing connection.

To create a link to equipment:

1. From the **Creating** pull down menu select **Link Equipment**.
2. Specify equipment parameters to search.
3. From the search results, select the equipment to be placed under the virtual site.

9.4 Customization

In this menu item (Settings > Customization) you can make user-specific settings (non-administrator users) and system level settings (admin users).

The following topics are covered in this section:

- "Customizing Display Preferences (Non-Administrator Users Only)" on page 233
- "Customizing Public (Admin only) and Private Menu Items" on page 236
- "Configuring Public and Private Charts" on page 238
- "Setting E-mail Addresses (Admin only)" on page 243

9.4.1 Customizing Display Preferences (Non-Administrator Users Only)

NOTE

This section is applicable to Non-administrator users only

You can select and modify the display preferences per your needs.

To customize display preferences:

1. From the main menu select Settings.
2. From the Settings panel select Customization > Preferences. The submenu has a single page only.

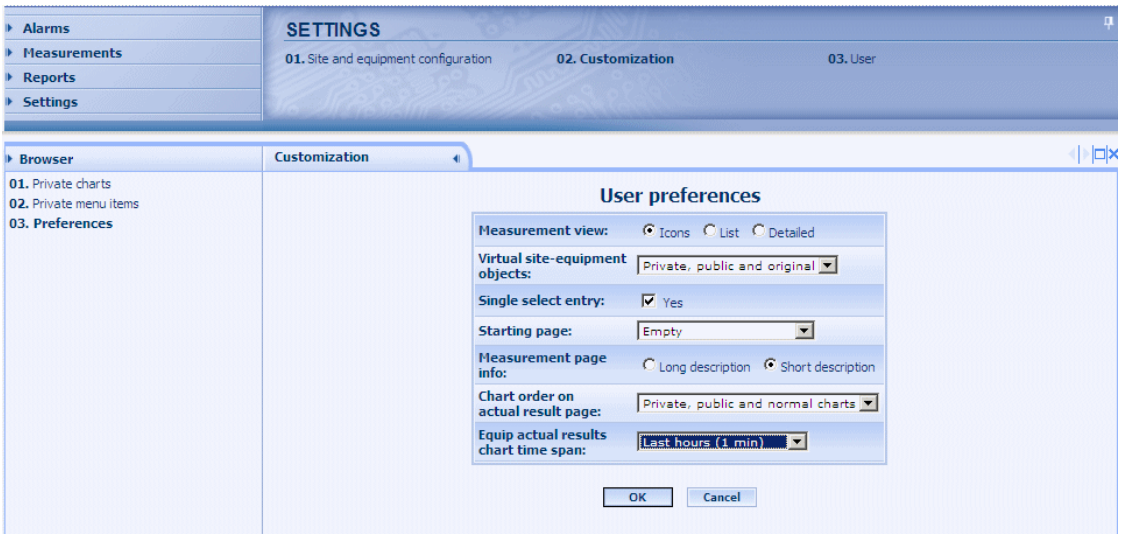


Figure 9-9: User Preferences

3 Modify the preferences as required:

- **Measurement view:** select the default view for the site and equipment configurations. For every page the view can be changed temporarily with the small icons located at the top of the page.

  - **Icons:** Large icons representing the sites and equipment, up to five in a row.
  - **List:** Small icons representing the sites and equipment, up to five in a row.
  - **Detailed:** a single element per row with the following columns:
    - **First column:** The element icon, this differentiates the equipment from the sites
    - **Name:** The name of the element
    - **Description:** The description of the element
    - **Equipment data:** Used only for equipment, contains all measurement server specific data of the equipment (e.g. community for SNMP).

- **Virtual site-equipment hierarchy:** This controls whether the private and public virtual, or the default hierarchy should be displayed below the Measurements > Current measurements submenu. The possible settings are:
  - Private and original
  - Public and original
  - Private, public and original (default)
  - Only private
  - Only public
  - Private and public
- **Single select entry:** If this option is set, then:
  - Under the “Equipment Search” menu item, the equipment will be immediately displayed if the search has a single result only
  - Below the “Current measurements” menu item the page for a given piece of equipment will be displayed immediately if the user has the rights for a single piece of equipment only, furthermore the elements of a site will also be displayed if only a single site could be accessed.
- **Starting page:** Choose the value from the scroll down list:
  - **Empty:** the initial page is displayed for the user after login
  - **Menu items:** the page below the given menu item is displayed for the user after login, its value can be one of the menu items below Alarms and Measurements
- **Measurement page info:** The amount of equipment information displayed on the page containing the measurements.
- **Chart order on actual result page:** Whether the public and/or private charts should be displayed on the base measurement page accessed through the Current measurements menu item. Moreover, if they are displayed, then in what order (this setting does not influence the display of virtual equipment, there only created charts are displayed in the order they were configured)

- **Equipment actual results chart time span:** On the equipment measurement page the chart resolution cannot be specified, instead the user can set the value here. By default this is the suggested 5-minute resolution daily chart. The smallest chart on the page displaying the details of individual measurements is set based on the time interval of the measurement, but in case of public and private charts the value given here is used.

4 Click **OK**; The modifications is saved and the page is refreshed with the modified data.

9.4.2 Customizing Public (Admin only) and Private Menu Items

You can create shortcut menu items under the Alarms and Measurements main menus.

To edit a menu item:

1 From the Settings > Customization select Public/Private Menu Items; The Menu Item Configuration page is displayed.

NOTE

The menu item configuration can also be performed from the Alarms and Measurements main menu items: after selecting the object, select the Save as Submenu action the Operation pull down menu on the right-hand side (see also "Saving Items as A Submenu" on page 161.

Figure 9-10: Menu Item Configuration

2 Click **[edit]**; The following page is displayed:

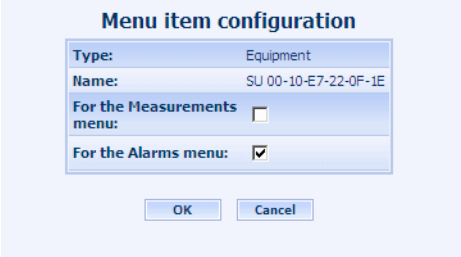


Figure 9-11: Menu Item Editing

3 Set the menu in which the edited menu item will be displayed. For charts, only the "for the Measurements menu" option can be selected.

4 Click **OK**; The Alarms or Measurement pages will be updated according to your selections.

To add a new menu item:

1 Select a schematic map (created by the administrators).

2 Select the virtual or real site or equipment to which the menu item points.

3 In Settings > Customization select Public/Private Menu Item; the Menu Item Configuration window is displayed (see Figure 9-10).

4 Click **[add new]**; A search window appears where a search string has to be specified (the % and _ characters can be used, * and ? characters are no applicable) to obtain the list of matching elements.

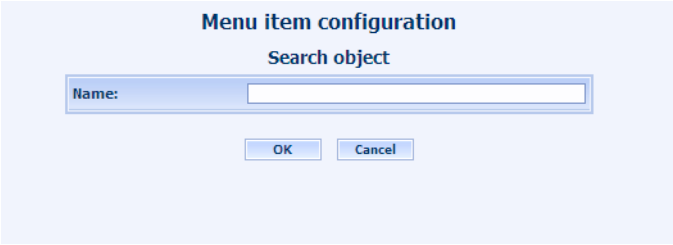


Figure 9-12: Menu Item Configuration - Search Object

5 Select the item to add to the Alarms or Measurement submenus and Click **OK**.

9.4.3 Configuring Public and Private Charts

Administrators and restricted administrators can edit private and public charts, while admin users can edit only public charts, and every other user - only private charts. The editing of both types takes place on pages structured almost identically; therefore, both are discussed herein, while indicating the differences between them.

9.4.3.1 Editing and Creating Charts

When modifying already existing elements in the chart, the same fields are displayed with the only difference that the name of the previously selected object in the object field cannot be changed.

To initiate chart editing:

1 Access the Chart Configuration page (Figure 9-13) using one of the following methods:

- Select Settings > Customization > Public charts or Private charts submenu items.
- Select Settings > Site and Equipment Configuration (when a non-virtual site or equipment is selected in the hierarchy). This case differs from a menu based direct access in the following points:
  - It is not necessary to specify the site and equipment name filter conditions when creating a new chart because the results are filtered automatically for the object at which the user started editing the chart.
  - There is a [back] link on the starting page, which leads back to the appropriate site or equipment.
  - Similarly to the Site and equipment configuration, both the location in the site equipment hierarchy as well as a pull down menu with the usual operations appear on the top of the page.
  - If the chart template configuration is opened from the equipment page, then for the template based creation of new charts the system automatically offers the names of the equipment and template together for chart name. However in the other case only the template name will

be offered, which in general will not be unique in the system without modification (see below)

- If the chart template configuration is opened from the equipment page, it is possible to use all chart templates at the same time, which means that you can create all charts for the equipment templates in one step.

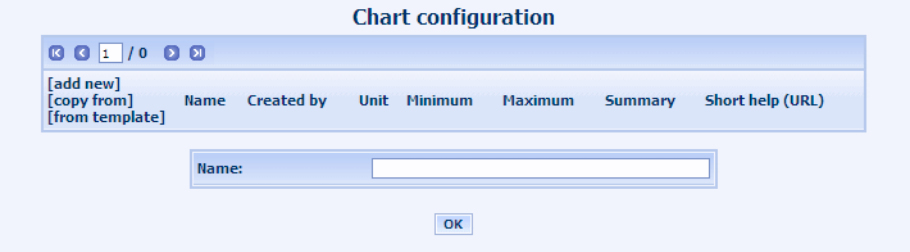


Figure 9-13: Chart Configuration (accessed from the Equipment page)

To modify chart elements:

1 Edit the information in the charts page as required. The page contains the list of private or public charts together with the following attributes:

- Editing links:
  - **[add new]**: creates a new chart
  - **[copy from]**: creates a chart based on an existing one. Both in the private and the public charts, you can choose from the list of your private charts and the public charts that you have access to.
  - **[from template]**: creates a new chart based on a template (see "Viewing Charts" on page 243)
  - **[from each templates]**: creating new charts from templates appears only if the chart creation is initiated from the equipment page. This list allows connecting of each chart to an existing template.
  - **[edit]**: edits the chart attributes that are displayed here
  - **[del]**: deletes chart
  - **[members]**: edits the members of the chart

- **Name:** The name of the chart. For public charts, it should be unique among the public charts, and for private charts it should be unique among the public and private charts. Accordingly, a public chart can be created with a name that already exists under the private charts of the user, or the same chart name can appear in the set of private charts belonging to many different users

- **Created by:** The name of the chart designer, naturally it is used for public charts only

- **Unit:** Description of the value axis of the chart

- **Minimum:** The chart minimum as a percentage or a concrete value. If it is not set, the minimum value is at 0. A percentage value is interpreted with respect to the average of the values displayed on the current chart

- **Maximum:** The chart maximum as a percentage or a concrete value. If it is not set, the maximum value is the current maximum value displayed in the chart. A percentage value is interpreted with respect to the average of the values displayed on the current chart

- **Summary:** determines if aggregate measurement values should be calculated in the table that corresponds to the chart. It can be turned on only if the chart has no element for which the Zero value (see below) is set to the previous zero value. Moreover, if it is turned on and such an element is created during chart modification or creation, it is turned off automatically.

- **Short description (URL):** This field is displayed only for administrator users. In this field a URL can be specified. If it is set, for each chart a Help sign appears for the users when the chart is viewed, and when clicking this link, the page pointed by the given URL is displayed in a new window.

NOTE

The editing and creating of these pages are not part of the StarQuality system

2 If you have administrator and restricted administrator user permissions, in addition to the above fields, you can change whether the chart is public or private.

3 Under the `[members]` link is the list of chart elements of the current chart. The items of this table are the following in order:

- Editing links:
  - **[add new]**: creating a new element
  - **[edit]**: modifying an element
  - **[del]**: deleting an element
- **Order:** The order of the element within the chart. The order not only determines the drawing order of the elements on the chart but it also influences the reference point of the chart base. The order can be modified on this starting page with the green down and up arrows.
- **Name:** The name of the element, which appears in the table of values on the chart
- **Object:** The object for which the element contain data. For chart elements the object can be a basic site or basic equipment report. For measurement chart elements it can be an interface or other measurement.
- **Threshold or report variable:** Depending on the type of the element (report or measurement) it contains the name of the threshold violation or the report variable to be displayed
- **Field:** Which measured value belonging to the object, and optionally to the report variable, should be displayed by the chart element:
  - For measurement chart elements this can be an uplink or downlink.
  - For report charts this can be minimum, maximum, average, etc.
- **Type:** The representation of a chart element should be a line, an area or a bar
- **Chart base:** Selects the chart base of the chart element. With the exception of the first element (where naturally the 0 value necessarily corresponds to the zero) it is possible to choose, whether the chart base of the chart element should agree with the current chart base of the previous chart element (chart elements “drawn onto each other”) or with the current value of the previous chart element (chart elements “drawn over each other”). The following example shows the two different diagrams for the same value pair.
- **Color:** Element color

- **Peak color:** If the chart resolution (e.g. 15 minutes, 2 hours, etc.) is smaller than the value resolution (e.g. 15 minutes, 3 minutes, etc.), the application shows the calculated average on the chart (both on the chart defined here and on the default one). If a color is set here, the average values are displayed in addition to the maximum values of the data.

- **Transparent:** Determines whether the other possible chart elements behind the element should be visible. Its use is recommended if the type of the element is area or bar, and the value of the zero point parameters is not “previous value” but “previous zero”

- **Assume zero when value is missing:** If there is no measurement value at a given time, the application can draw the chart according to the last value, or assume the missing value to be zero.

To create a new element:

1. Select the type of the measurement or the report variable; The following configurable elements appear from the list mentioned above: name, object, and threshold (if a measurement is selected currently, see below), field, type, chart base, color, peak color, and zero value.
2. Edit the elements as required. Note that the order does not appear since the new element receives the last sequence number automatically. Depending on the object, maximum three pull down menus are displayed:
   - » In case of site level report variable: site pull down menu
   - » In case of equipment level report variable: site and equipment pull down menus
   - » In case of measurement element: site, equipment and measurement pull down menus

   The equipment pull down menu always displays the list of equipment directly under the currently chosen element in the site menu, while the measurement menu always shows the measurements under the currently selected equipment. When the selection of the pull down menus is changed, the page reloads automatically to reflect the current status.
3. Click **OK** to select the desired element

NOTE

The OK button appears only if all the necessary object pull down menus have been displayed according to the report variable or measurement selected in the first step. For example, when measuring communication traffic, this button appears only if a piece of equipment on a site and a measurement under that have been selected.

9.4.3.2 Deleting Chart Elements

Users can delete a chart element using the [del] link. However note the following limitations:

- If the user is not administrator and the user rights to an object are revoked, then the corresponding private chart elements are deleted too.
- When deleting an object, it is automatically removed from all chart definitions. If a chart becomes empty after such an operation, then the chart is deleted automatically as well.

9.4.3.3 Viewing Charts

By navigating the site-equipment hierarchy starting from the “Measurements” menu item, all private charts can be accessed and also public charts for which the user has access rights.

9.4.4 Setting E-mail Addresses (Admin only)

All users (except limited ones) may set up one or more e-mail address to which the system can send notifications on threshold violations.

A prerequisite to the actual e-mail sending is that the StarQuality server has been configure with an active SMTP server as described in “Mail Server Configuration” on page 95, Step 2.

To set an e-mail address:

1. From Settings > Customization select E-mail Addresses; A list of addresses appears.
2. Click **[add new]**; The E-mail Address Configuration window is displayed.

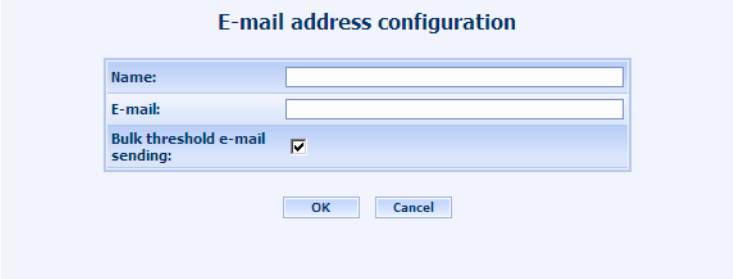
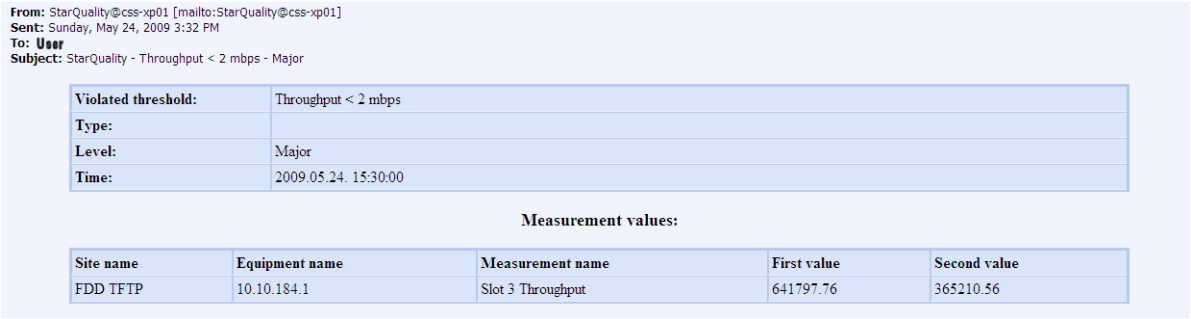


Figure 9-14: E-mail Address Configuration

3 Specify the following:

- **Name:** It must be unique for each user. This name will appear in the selection list for in the Thresholds Configuration window.
- **E-mail:** The e-mail address to where the messages should be sent.
- **Multiple threshold violations in one mail:** In case of a single sampling interval in which multiple threshold violations occurred, it is possible to send the notification in a single e-mail (bulk) instead of sending them separately. The bulk mail is less detailed than the separate e-mail.



From: StarQuality@css-xp01 [mailto:StarQuality@css-xp01]
Sent: Sunday, May 24, 2009 3:32 PM
To: User
Subject: StarQuality - Throughput < 2 mbps - Major

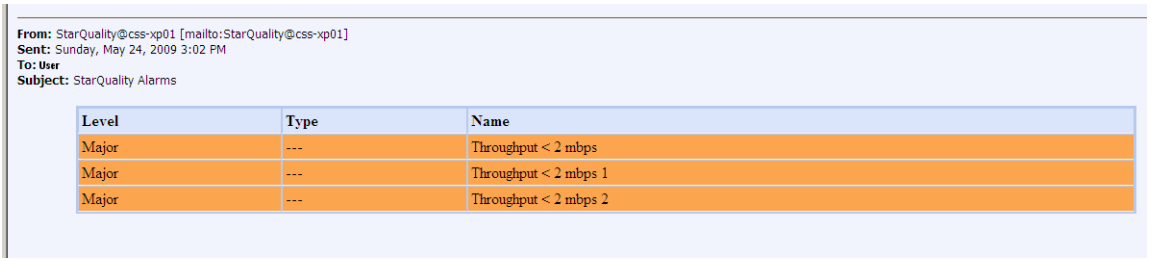
Violated threshold:	Throughput < 2 mbps
Type:	
Level:	Major
Time:	2009.05.24. 15:30:00

Measurement values:

Site name	Equipment name	Measurement name	First value	Second value
FDD TFTP	10.10.184.1	Slot 3 Throughput	641797.76	365210.56

Figure 9-15: Example of Separate Threshold Violation Notification

9.5 Templates (admin only)



From: StarQuality@css-xp01 [mailto:StarQuality@css-xp01]
Sent: Sunday, May 24, 2009 3:02 PM
To: User
Subject: StarQuality Alarms

Level	Type	Name
Major	---	Throughput < 2 mbps
Major	---	Throughput < 2 mbps 1
Major	---	Throughput < 2 mbps 2

Figure 9-16: Example of Bulk Threshold Violation Notification

- **MIB upload:** Not applicable.
- **Measurement type definitions:** Not applicable.
- **Equipment templates:** Not applicable.
- **Threshold templates:** Editing threshold templates (see "Setting Alarm Thresholds" on page 165)
- **Chart templates:** Not applicable. Editing chart templates (see "Viewing Charts" on page 243)
- **Exclusion window template:** Defining time frames in which thresholds can be activated/deactivated

9.6 Server Configuration and Management (Admin only)

The following topics are covered in this section:

- "Overview" on page 246
- "Licences" on page 247
- "Device and Measurement Summary" on page 249
- "Server Configuration" on page 249
- "Start/Stop/Status of Servers" on page 253
- "Viewing Server Events" on page 254
- "Collector Load" on page 255

9.6.1 Overview

Server configuration and management refers to two server types:

- Default server: e.g. the application manager or the report counting server. The number of servers cannot be extended or limited.
- Measurement servers: arbitrary number of these can exist and each must belong to a measurement server group. There are three types of measurement servers matching the types given for the measurement server groups:
  - » Active and discoverable: the measurements are actively made by the StarQuality application through the available API. The measurements supported by discoverable equipment can be discovered or queried through a suitable management protocol: e.g. the list of interfaces on network equipment or the list of disk partitions on a UNIX server. These are discovered and automatically monitored by the StarQuality (e.g. it automatically deletes them if the measurement has ended or the measurement name has changed). Even though the StarQuality automatically searches the measurements in such a case, they can also be manually recorded. If such a measurement is created, subsequent

automatic discovery will not occur. Accordingly, if the measured object is deleted from the active equipment, it will not disappear from the StarQuality. This type of measurement will again be monitored automatically only if a new manual discovery is performed on the equipment through the web interface and it is saved afterwards. For certain discoverable servers there are measurement types (e.g. servers measuring IPSec) where no discovery is performed.

» Active but non-discoverable: the measurements are actively made by the StarQuality application through the available API, but it is impossible to discover and monitor the measurements of the equipment. This is typical when parameters need to be set for the measuring system in order to start the measurements (e.g. one or more WEB server addresses should be given to measure HTTP services).

» Passive and optionally capable of auto-discovery: the StarQuality only collects files containing measurement values in certain defined formats, and optionally records and deletes the pieces of equipment and measurements based on the collected data.

The Servers menu includes five submenus, described herein.

9.6.2 Licences

9.6.2.1 Overview

The licence for StarQuality is an encrypted file which defines:

- Validity period - either unlimited or temporary.
- Number of collector Network Elements (NEs) of any type - BTSs only (disregarding the number of AUs under each BTS. No. of SUs is unlimited, except for FDD 3.5/3.6: 10 SUs per BTS).

The installation CD includes a temporary licence file for a limited period of time and limited number of NEs.

To receive acquire the permanent licence, access the Alvarion on-line feature licence application (refer to *Getting Feature Licenses* Guide)

9.6.2.2 Managing Licences

The Licences submenu is available only for admin users. You can edit the license table and compare the number of available and required licences. If there are fewer licences available than required for operating the system, or any of the

licenses has expired, then users receive a warning message during the login process.

Licence data can only uploaded and deleted but not edited. The individual columns are:

- Editing links:
  - **[add new]**: adding a new licence file
  - **[del]**: deleting a licence entry
- **Name:** Name of the licence
- **End date:** Expiration date of the given licence. If it is unlimited, then use “never”
- **Quantity:** Quantity of licences in the system. Can be unlimited.
- **Needed:** Quantity required to operate the system
- **Error type:** In those rows where the licence is invalid an error message is shown and the row is displayed in red. Possible error messages:
  - Wrong checksum: invalid line since someone directly modified the licence entry
  - Expired: licence was valid for a limited period only which has expired
  - No licence found: the given licence entry is required but not found
  - Low licence quantity: the quantity of the given licence is not enough for the system

A licence can be added by providing a licence file. During this process the application keeps the already existing licence entries or modifies them if they exist in the file.

To add a new licence:

1. Place the licence file on the computer from which you activated the client.
2. From Settings select Servers; the Servers tab is displayed.

3 Select Licences. The Licences Configuration window is displayed.

4 Click **[add new]** and browse for the file containing the license.

5 Click **OK**. A list detailing the licenses is displayed.

6 Verify that the entry in the license list is not colored red.

9.6.3 Device and Measurement Summary

You can display a list of all basic equipments, and for each measurement type - the number of objects in the system.

To use the summary list:

From Settings select Servers > Device and Measurement Summary; A table of all devices is displayed, indicating the site and equipment name, IP address, F H C A and total number of measurements.

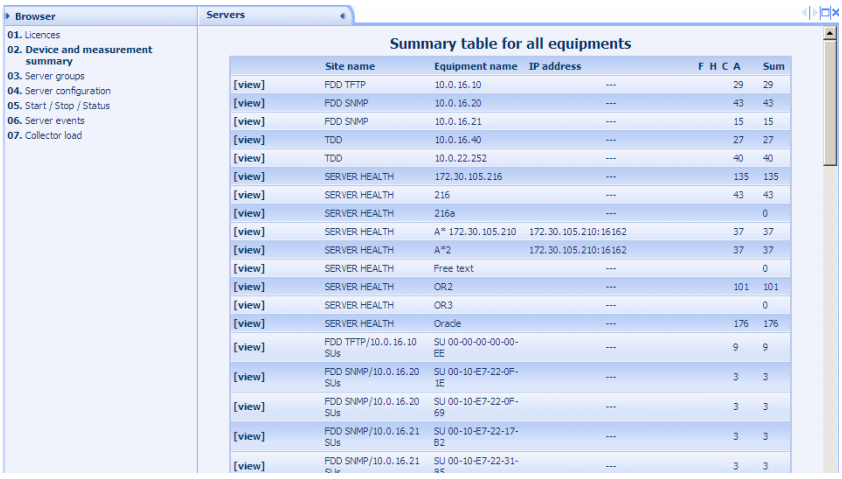


Figure 9-17: Device and Measurement Summary

9.6.4 Server Configuration

Server configuration is available for the admin users only. You can add new servers, or delete and modify existing servers.

To access the Server Configuration:

1 From the main menu select Settings.

2 From the Settings panel select Servers > Server Configuration; A list of all configured servers is displayed.

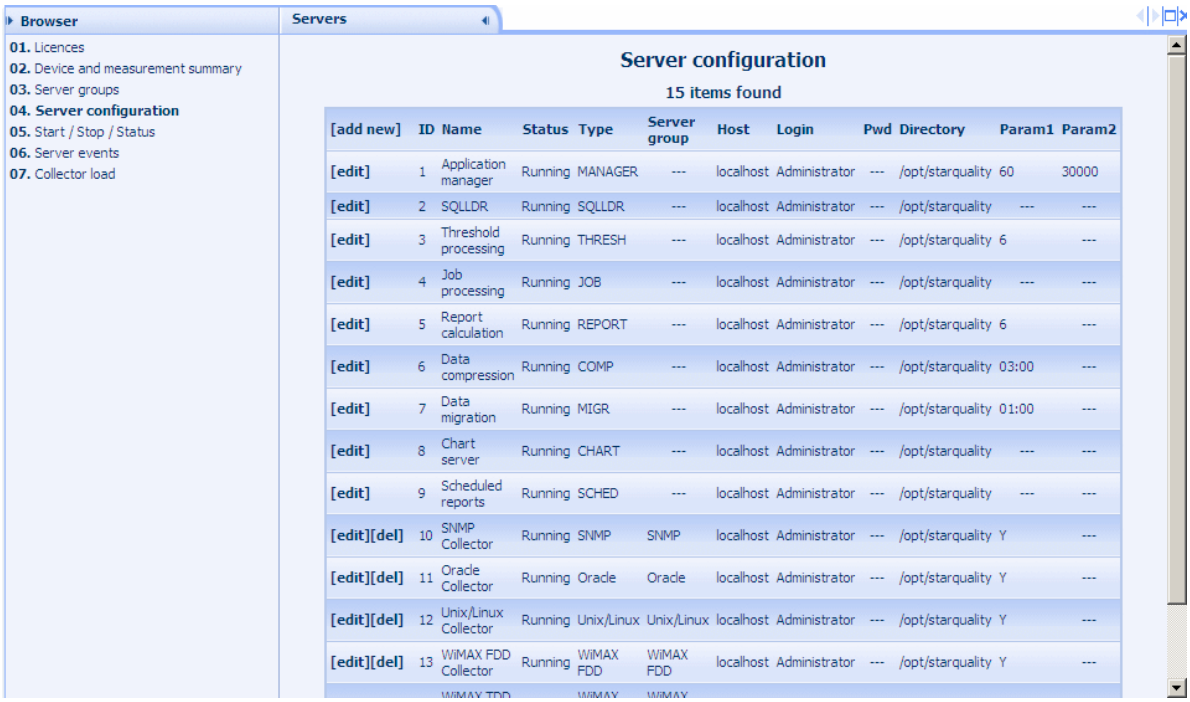

Browser
01. Licences
02. Device and measurement summary
03. Server groups
04. Server configuration
05. Start / Stop / Status
06. Server events
07. Collector load
Servers
Server configuration
15 items found
[add new] ID Name Status Type Server group Host Login Pwd Directory Param1 Param2
[edit] 1 Application manager Running MANAGER --- localhost Administrator --- /opt/starquality 60 30000
[edit] 2 SQLLDR Running SQLLDR --- localhost Administrator --- /opt/starquality --- ---
[edit] 3 Threshold processing Running THRESH --- localhost Administrator --- /opt/starquality 6 ---
[edit] 4 Job processing Running JOB --- localhost Administrator --- /opt/starquality --- ---
[edit] 5 Report calculation Running REPORT --- localhost Administrator --- /opt/starquality 6 ---
[edit] 6 Data compression Running COMP --- localhost Administrator --- /opt/starquality 03:00 ---
[edit] 7 Data migration Running MIGR --- localhost Administrator --- /opt/starquality 01:00 ---
[edit] 8 Chart server Running CHART --- localhost Administrator --- /opt/starquality --- ---
[edit] 9 Scheduled reports Running SCHED --- localhost Administrator --- /opt/starquality --- ---
[edit][del] 10 SNMP Collector Running SNMP SNMP localhost Administrator --- /opt/starquality Y ---
[edit][del] 11 Oracle Collector Running Oracle Oracle localhost Administrator --- /opt/starquality Y ---
[edit][del] 12 Unix/Linux Collector Running Unix/Linux Unix/Linux localhost Administrator --- /opt/starquality Y ---
[edit][del] 13 WiMAX FDD Collector Running WiMAX FDD WiMAX FDD localhost Administrator --- /opt/starquality Y ---

Figure 9-18: Server Configuration Window

The following information is displayed in the table:

- **ID:** unique identifier of the server. It is used when starting and halting the server from the command line, or when displaying the summary of the collected data for the measurement servers.
- **Name:** the name of the server
- **Status:** status of the server: running, not running, or unknown; Refer to "Editing Server Configuration" on page 252
- **Type:** the type of the server; or the type of the server group for collector servers: SOAP, Manager, Event
- **Server group:** for a measurement server the name of its group
- **Host:** the host computer of the server
- **Login:** the user name used to login to the machine

- **Pwd:** user password. If it is not set, the application can still log in if SSH key-based authentication is configured

- **Directory:** the directory of the StarQuality application. The name of the directory should be an absolute path (i.e. it should started with /)

- **Param1 and Param2:** Further parameters depending on the type of the server, displayed with the appropriate name.

  - **Measurement server:**

    - Persistent SSH and SFTP connection (Param1): Whether the SQLLDR and the MANAGER server can keep a persistent SSH and SFTP connection with the measurement server or not. Persistent connection is strongly recommended since nonessential logins and logouts can be avoided. There is only one case when non-persistent connection is necessary: in the case of certain former SSH implementations the established SFTP connection has fully utilized the CPU of the target machine, even when no operation was executed

    - How many seconds should the system wait for collector result if it is not running (Param2).

  - **Application manager:**

    - Cycle (in sec): The number of seconds waited between server monitoring

    - Number of files: During self-testing the system checks the number of files in the tmp/done directory that executes the data loading component. If this is higher than the value specified here, the system generates a server event and notifies the operator.

  - **Data compression and moving and partition creation:** the time of running (HH:MM): These servers execute operations once a day (though they are continuously running). Partition creation is an exception since the daily operation is executed immediately at startup.

  - **Threshold procession and report creation:** the maximum time period (in hours) of former data to be processed at startup. At startup both of these servers determine the time up to which the individual thresholds as well as report variables were processed, and if the hour of the last processing is smaller than the current hour minus the specified time period, then they consider the processing to be done up to the current hour minus the specified time period. For example: if the five-minute thresholds were

processed by the server up to 8:55, and it is restarted at 18:05 (same day), and the set value is 6, then processing will only be continued from 12:00

9.6.4.1 Editing Server Configuration

During the configuration of the servers the following fields can be modified: name, host, login, password and the optional parameters. The host, login and directory parameters can only be modified if the given server is not running.

To edit a server configuration:

1 Click **[edit]** next to one of the entries; the Server Configuration editing window is displayed.

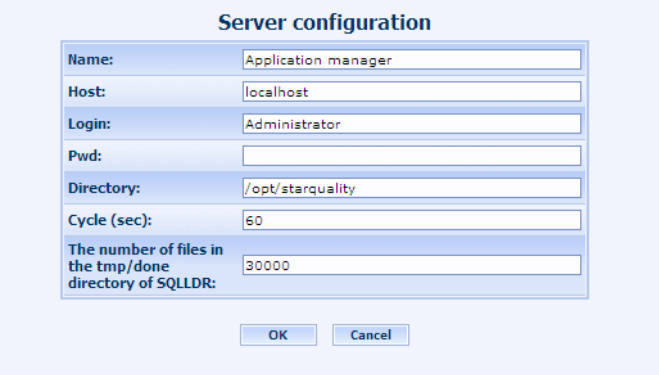


Figure 9-19: Editing Server Configuration

2 Specify the required information: name, host, login, password and the optional Param1 and Param2.

3 Click **OK**.

9.6.4.2 Adding a New Server

Adding and deleting a server is possible for measurement, SOAP, secondary application manager and secondary event receiver servers.

When a measurement server is added, a server group is also added to the table in the Server Configuration window.

To add a new server:

1 In the Server Configuration window, click **[add new]**; The server Configuration editing window is displayed.

Figure 9-20: Server Configuration - Adding New

2 Specify the required information: Name, type, host, login, password and directory.

3 Click **OK**.

9.6.5 Start/Stop/Status of Servers

This feature is available for the admin and administrator users only. The page displays the current status of servers by color coding. The columns of the table are identical to the table in "Server Configuration" on page 249 (except for password). You can start and stop the servers and check for their status manually, in addition to the automatic server check of the application manager.

The page is continuously refreshed. After starting and stopping server(s) the subsequent refreshing also checks their status.

The servers can be in three different statuses: Running, Not running and Unknown. Unknown status means that it cannot be determined whether the server is running or not: for example it is impossible to login with the specified data to the computer running the server.

Only measurement servers with "running" status will be assigned to measure equipments. A server may be configured to the equipment, and another server is modified to be a secondary measurement server. Each measurement server measures all those pieces of equipment where it is a primary or secondary server, and after a certain period it deletes secondary server registrations where it is the

primary server. Due to this algorithm no measurement would be omitted even if, for example in a measurement server group, one of the servers is started when another server has already been run: even though load balancing transfers a certain part of the equipment, both of them will measure the transferred pieces of equipment temporarily.

To use the Server Start/Stop/Status window

1 From Settings select Servers > Start/Stop/Status. A list of all servers is displayed. Running servers are colored green, Not running servers are colored red.

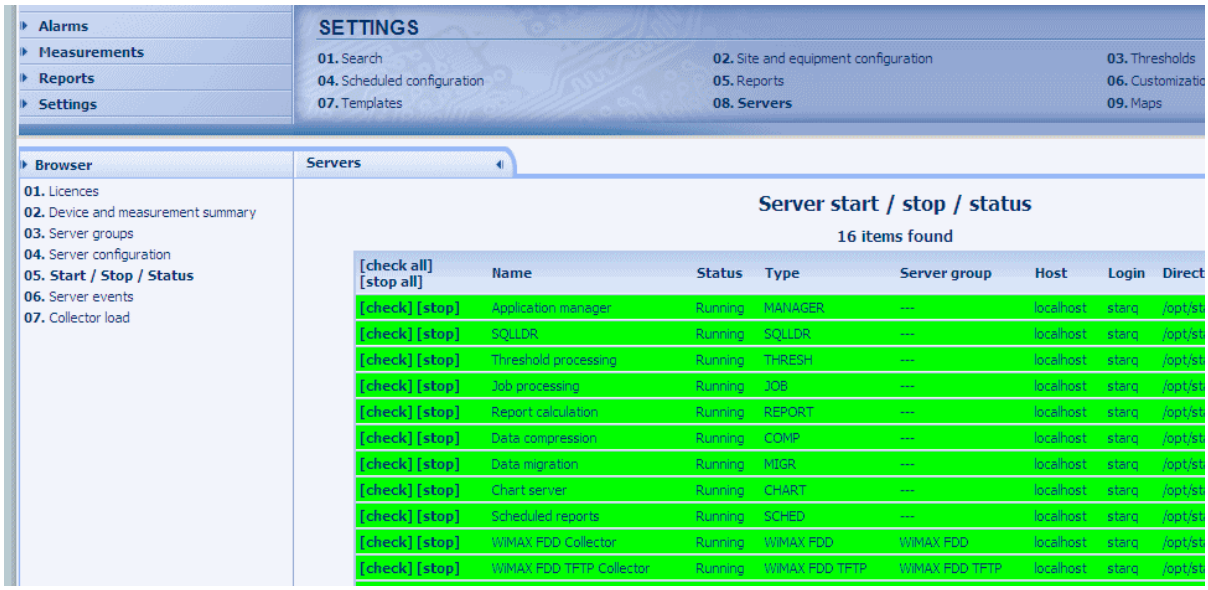

Alarms
Measurements
Reports
Settings
SETTINGS
01. Search
02. Site and equipment configuration
03. Thresholds
04. Scheduled configuration
05. Reports
07. Templates
08. Servers
09. Maps
Browser
01. Licences
02. Device and measurement summary
03. Server groups
04. Server configuration
05. Start / Stop / Status
06. Server events
07. Collector load
Servers
Server start / stop / status
16 items found
[check all] [stop all]
Name
Status
Type
Server group
Host
Login
[check] [stop] Application manager Running MANAGER --- localhost starq
[check] [stop] SQLLDR Running SQLLDR --- localhost starq
[check] [stop] Threshold processing Running THRESH --- localhost starq
[check] [stop] Job processing Running JOB --- localhost starq
[check] [stop] Report calculation Running REPORT --- localhost starq
[check] [stop] Data compression Running COMP --- localhost starq
[check] [stop] Data migration Running MIGR --- localhost starq
[check] [stop] Chart server Running CHART --- localhost starq
[check] [stop] Scheduled reports Running SCHED --- localhost starq
[check] [stop] WiMAX FDD Collector Running WiMAX FDD WiMAX FDD localhost starq
[check] [stop] WiMAX FDD TFTP Collector Running WiMAX FDD TFTP WiMAX FDD TFTP localhost starq

Figure 9-21: Server Status

2 Click either **Start** or **Stop** to change the status, or **Check** to manually check and refresh the status.

9.6.6 Viewing Server Events

The application manager module (or modules if the secondary application manager is also installed) periodically performs different verifications in connection with the database and the machines running StarQuality. You can view the results of these verifications and the log entries created when modules are started or stopped.

To access the Event Server list:

From Settings select Servers > Server Event; The server events list is displayed.

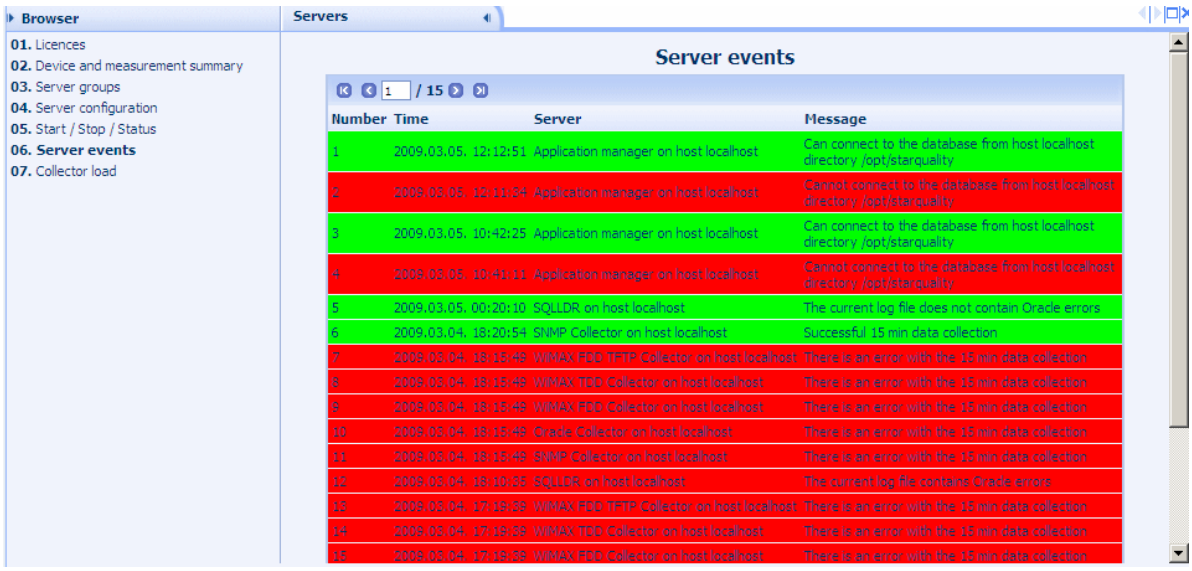

Browser
01. Licences
02. Device and measurement summary
03. Server groups
04. Server configuration
05. Start / Stop / Status
06. Server events
07. Collector load
Servers
Server events
1 / 15
Number Time Server Message
1 2009.03.05. 12:12:51 Application manager on host localhost Can connect to the database from host localhost directory /opt/starquality
2 2009.03.05. 12:11:34 Application manager on host localhost Cannot connect to the database from host localhost directory /opt/starquality
3 2009.03.05. 10:42:25 Application manager on host localhost Can connect to the database from host localhost directory /opt/starquality
4 2009.03.05. 10:41:11 Application manager on host localhost Cannot connect to the database from host localhost directory /opt/starquality
5 2009.03.05. 00:20:10 SQLLDR on host localhost The current log file does not contain Oracle errors
6 2009.03.04. 18:20:54 SNMP Collector on host localhost Successful 15 min data collection
7 2009.03.04. 18:15:49 WiMAX FDD TFTP Collector on host localhost There is an error with the 15 min data collection
8 2009.03.04. 18:15:49 WiMAX TDD Collector on host localhost There is an error with the 15 min data collection
9 2009.03.04. 18:15:49 WiMAX FDD Collector on host localhost There is an error with the 15 min data collection
10 2009.03.04. 18:15:49 Oracle Collector on host localhost There is an error with the 15 min data collection
11 2009.03.04. 18:15:49 SNMP Collector on host localhost There is an error with the 15 min data collection
12 2009.03.04. 18:10:35 SQLLDR on host localhost The current log file contains Oracle errors
13 2009.03.04. 17:19:39 WiMAX FDD TFTP Collector on host localhost There is an error with the 15 min data collection
14 2009.03.04. 17:19:39 WiMAX TDD Collector on host localhost There is an error with the 15 min data collection
15 2009.03.04. 17:19:39 WiMAX FDD Collector on host localhost There is an error with the 15 min data collection

Figure 9-22: Server Events Window

9.6.7 Collector Load

This feature is available for the admin and administrator users only. You can view results for all possible measurement times, and the list of measurements that were unsuccessful at a given time.

To use the Collector Load Information:

1 From Settings select Servers > Collector Load; The list of measurement servers is displayed, with the following information:

- General information: name, type, status and group
- Size of the data files created by the server
- Total number of equipments connected

» Total number of measurements performed

» F H C A - identifies the type of the measurement: F for traffic, H for error, C Deprecated and A for Alvarion measurements.

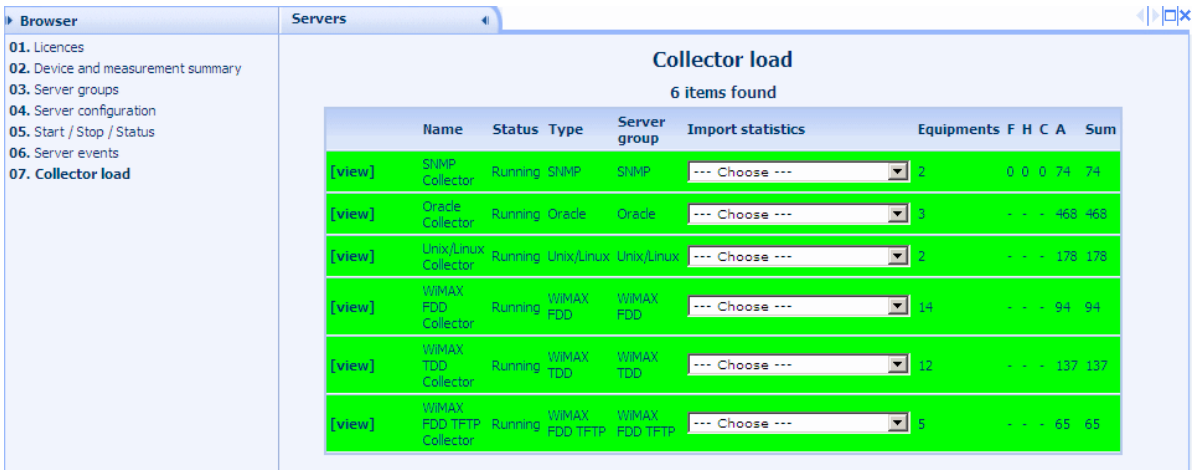

Browser
01. Licences
02. Device and measurement summary
03. Server groups
04. Server configuration
05. Start / Stop / Status
06. Server events
07. Collector load
Servers
Collector load
6 items found
Name Status Type Server group Import statistics Equipments F H C A Sum
[view] SNMP Collector Running SNMP SNMP --- Choose --- 2 0 0 0 74 74
[view] Oracle Collector Running Oracle Oracle --- Choose --- 3 - - - 468 468
[view] Unix/Linux Collector Running Unix/Linux Unix/Linux --- Choose --- 2 - - - 178 178
[view] WiMAX FDD Collector Running WiMAX FDD WiMAX FDD --- Choose --- 14 - - - 94 94
[view] WiMAX TDD Collector Running WiMAX TDD WiMAX TDD --- Choose --- 12 - - - 137 137
[view] WiMAX FDD TFTP Collector Running WiMAX FDD TFTP WiMAX FDD TFTP --- Choose --- 5 - - - 65 65

Figure 9-23: Collector Load

2 You can use the scroll down menu in the Import Statistics column to display results for all possible measurement times, independently from the fact whether a measurement of that interval currently belongs to the given measurement server or not (since the query examines data collected earlier, too). As a hint the current time interval is indicated in green, with the number of measurements running with that interval.

If you select a different interval, the Statistics page is automatically displayed.

3 Click the **[view]** link in the first column; A page identical to the one displayed from Settings > Measurements > Summary is displayed, filtered by the selected measurement server.

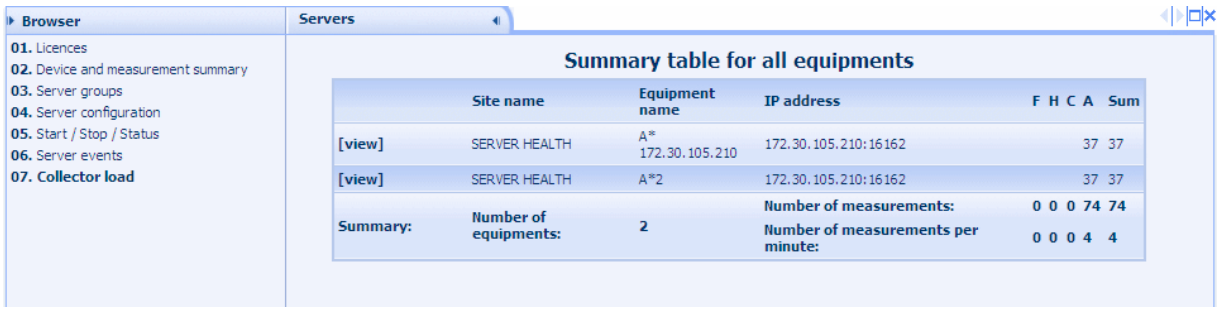

Browser
01. Licences
02. Device and measurement summary
03. Server groups
04. Server configuration
05. Start / Stop / Status
06. Server events
07. Collector load
Servers
Summary table for all equipments
Site name
Equipment name
IP address
F H C A Sum
[view] SERVER HEALTH A* 172.30.105.210 172.30.105.210:16162 37 37
[view] SERVER HEALTH A*2 172.30.105.210:16162 37 37
Summary: Number of equipments: 2
Number of measurements: 0 0 0 74 74
Number of measurements per minute: 0 0 0 4 4

Figure 9-24: Collector Load Statistics

4 You can view the list of measurements that were unsuccessful at a given time by clicking on the **[view]** link: The list of devices and measurements are displayed together with another link that opens to the configuration panel of the device.

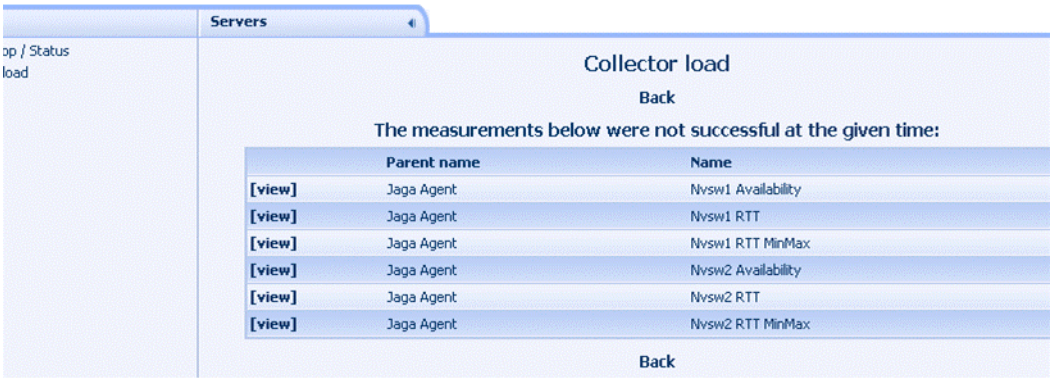


Figure 9-25: Missing Measurements at a Given Time

9.7 Audit Trail

The application records each configuration modification – equipment, site, measurement creation, modification, deletion, modification of reports and thresholds, etc. – that can be displayed under the Audit Trail menu item. The administrators are allowed to view every change, the restricted administrators are allowed to view only those changes which were made by themselves. The other users do not have access to this functionality. It also saves the name of the user who made the modification. It either equals to the user name at the WEB interface or it is a system value, if it was an automatic modification (e.g. an interface was cancelled in the equipment).

To start an audit trail query:

1 From Settings select Audit trail; The Audit Trail query page is displayed (Figure 9-26).

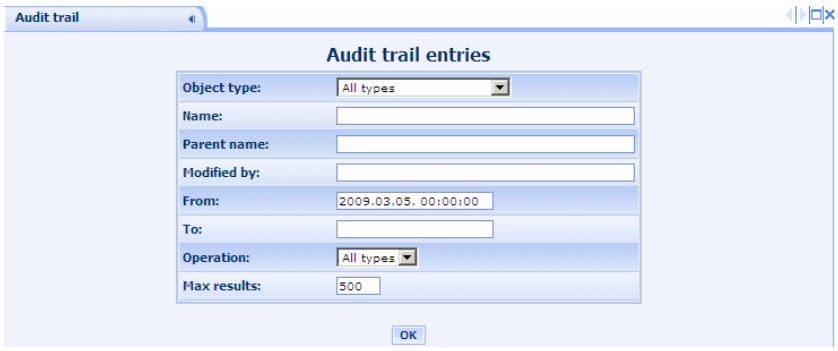


Figure 9-26: Audit Trail Query

2 Enter the filter conditions:

- **Object type:** Select a type from a scroll down menu. Possible values:
  - All: no type based filtering
  - Other: only the operations for the object types adequate for the selection appear
- **Parent name:** The name of the parent object; it can contain values only for equipments, measurement reports and chart elements
- **Name:** Object name
- **Modified by:** Name of the modifier. It is displayed only for the administrator users since the restricted administrators cannot view a change if it wasn't made by themselves.
- **From and To:** When it was modified (from-till)
- **All results:** Maximum number of displayed results. Mandatory to fill in

3 Click **OK**; The query produces a table with columns similar to the search results with the following additional items:

- Operation: Insert, Modification or Delete
- Object type
- Name
- Parent name
- Modified by
- Modification time

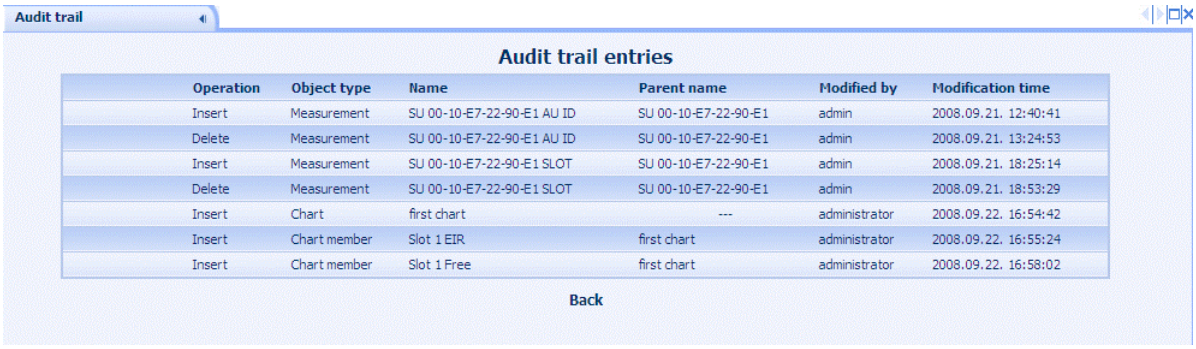

Audit trail
Audit trail entries
Operation Object type Name Parent name Modified by Modification time
Insert Measurement SU 00-10-E7-22-90-E1 AU ID SU 00-10-E7-22-90-E1 admin 2008.09.21. 12:40:41
Delete Measurement SU 00-10-E7-22-90-E1 AU ID SU 00-10-E7-22-90-E1 admin 2008.09.21. 13:24:53
Insert Measurement SU 00-10-E7-22-90-E1 SLOT SU 00-10-E7-22-90-E1 admin 2008.09.21. 18:25:14
Delete Measurement SU 00-10-E7-22-90-E1 SLOT SU 00-10-E7-22-90-E1 admin 2008.09.21. 18:53:29
Insert Chart first chart --- administrator 2008.09.22. 16:54:42
Insert Chart member Slot 1 EIR first chart administrator 2008.09.22. 16:55:24
Insert Chart member Slot 1 Free first chart administrator 2008.09.22. 16:58:02
Back

Figure 9-27: Audit Trail Entries

4 For “update” type changes, the first column also contains a **[view]** link; Click it to display the exact description that contains, the modified value in addition to the above elements.

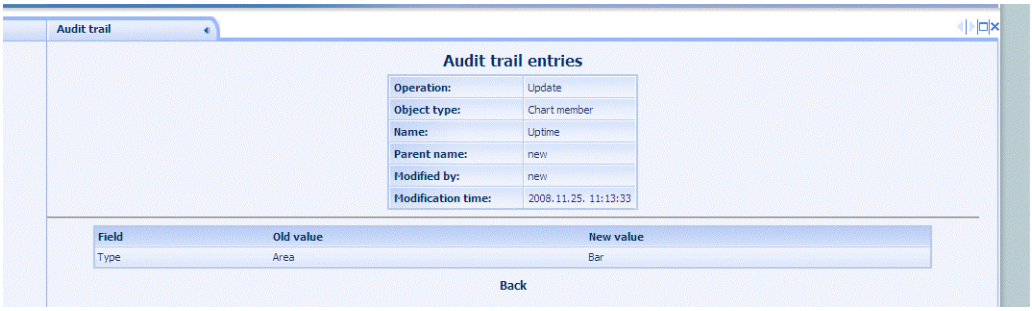


Figure 9-28: Viewing the Audit Trail

9.8 User Administration (Admin only)

The administrator user can manage the list of users and their permissions, and add new users to the system. Every administrator has the right to modify normal users, while only the admin user can modify administrators. Restricted administrators cannot modify a user except if it was created by themselves. No user can delete the admin user.

9.8.1 Registering/Modifying Users

To add or modify users:

1 From the Settings menu select User. The browser displays a list of user administration tasks. The Users tab displays a list of existing users.

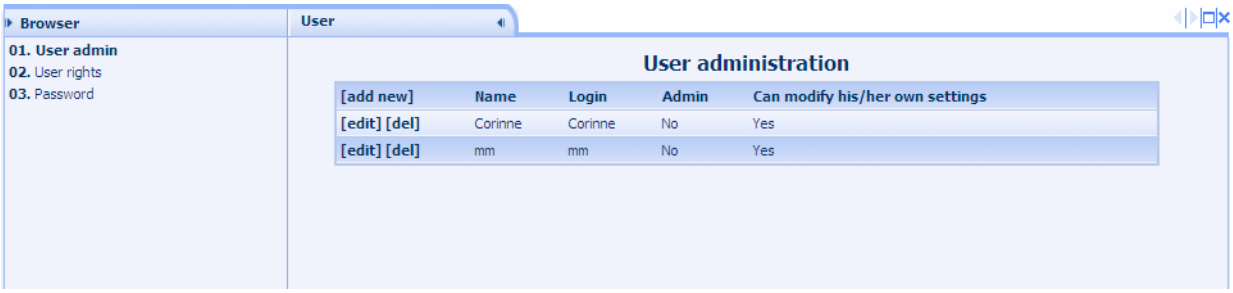


Figure 9-29: Users List

2 Select either **[add new]** or **[edit]** to modify a user (select **[delete]** to delete a user from the list); the following user definition fields are displayed.

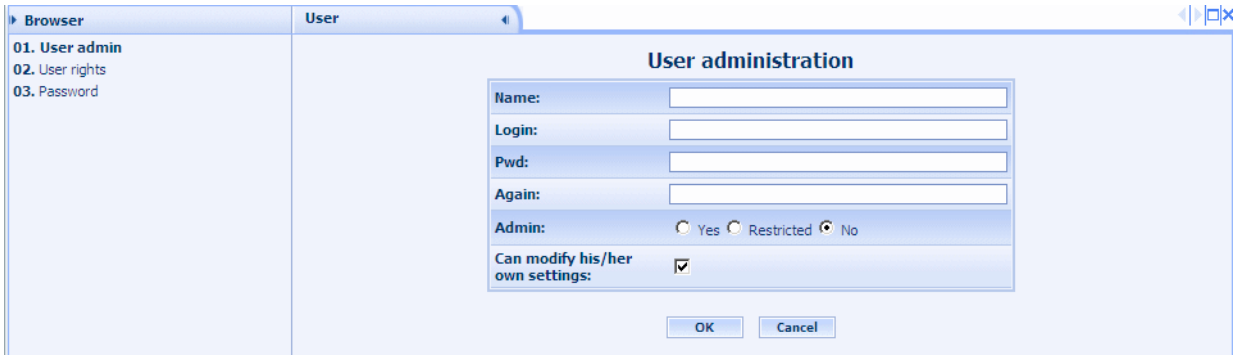


Figure 9-30: User Administration

3 Specify the following parameters for the added or modified user:

» **Name:** The name of the user, e.g. First-name Family-name

» **Login:** The user will be able to login with this name. It is suggested to use the small case letters of the English alphabet. The given value must be unique

» **Password:** An initial password. If you do not specify a new password, then only the name and the admin fields are modified.

» **Admin:** This option is only available if you are logged in with the admin user. The options are:

Table 9-1: Admin Registering Options[a]

Option	Description
Yes	Provide the registered user with administrator rights
Restricted	Provide the registered user with restricted administrator rights
No	Provide the registered user with normal or restricted rights based on the value of the next parameter

a. Refer to "User Types and Their Settings" on page 6 for more information

» **Can modify own settings:** The user can only modify their password, preferences, own virtual hierarchy and charts if this field is checked. For administrator and restricted administrator users this is always set automatically.

9.8.2 User Permissions (Rights)

9.8.2.1 Overview

For normal users, the access rights can be changed in four different levels:

- Site, equipment, measurement: These three objects are in a tree hierarchy, in which you can choose the items that the user can view. If you appoint one of these objects, then all objects below it can also be accessed by the user.

  For example, if the user has the access rights to the ROOT item (zero level site), all the objects in the system are accessible. If the user has access rights to one site, then all sites, equipment and measurements below it are accessible; however if access rights are provided only for the equipment, then

only that equipment and its measurements are accessible; access right to the measurement only makes only that measurement accessible.

Note that the rights are given only for the base hierarchy, and not for a virtual site, equipment or public chart, since the system calculates the permissions for these from the corresponding base objects.

- **Chart**: For each individual chart it can be specified whether the user can view it or not.

- **Report**: For each individual report, the user access can be set independently, which will be later combined with the access rights specified for the related site-equipment, so for example in a chart containing sites, only those rows for which the user has the rights are displayed.

- **Threshold**: Specifies if the user may view the threshold violations or not. If yes, then the system calculates also the domain of the viewable thresholds automatically based on the privileges of the base object. This entry is missing for the restricted administrators because they have always the right to see (and edit) thresholds.

9.8.2.2 Modifying User Rights

If you modify a user as a restricted administrator then you can grant rights only for those objects for which you have right as well. Later on an administrator can grant more right to the user. However, if the right setting for a restricted administrator is edited (even if there was no change), then the system automatically checks all users created by that restricted administrator and revokes the rights for all objects for which that restricted administrator does not have right.

The user can view certain measurements without any special settings, those that belong to some of the agents. This is true only if the user can view the equipment, and the measurement of the agent is the same as the name of the equipment, or starts with that name and is followed by a space.

The set of visible public virtual sites, pieces of equipment and charts are determined automatically based on the measurement objects accessible by the user. For example:

- The users can only view a public virtual site if they have the right to view its real or virtual parent site

- The user scan view a virtual piece of equipment if they have the right to see all charts of that equipment.
- The user can view a public chart if they can view all measurements displayed on the chart.

To modify user rights:

1 From Settings > User select User Rights; The User Rights window is displayed.

Figure 9-31: User Selection

2 Select the user type and select whether the equipments and the measurements should also be included in the list of displayed objects.

3 Click **OK**; The User Rights modification window is displayed. The elements that cannot be accessed by the user are displayed on the left-hand side, while those that can be viewed on the right-hand side.

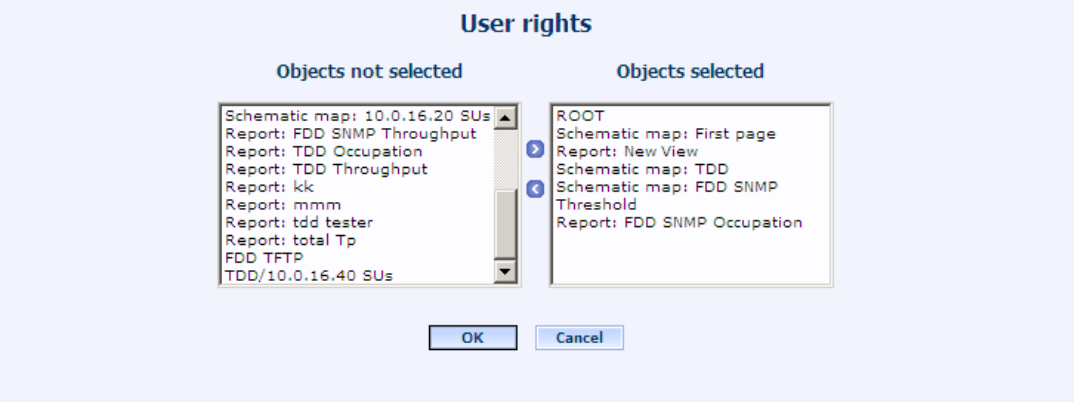


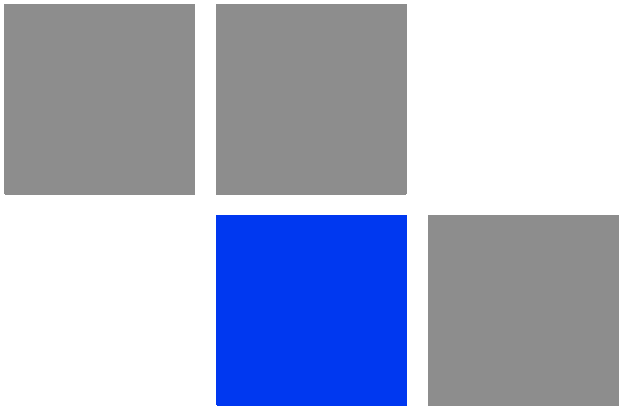
Figure 9-32: User Rights Modification

4 Select one or more items from either of these lists and move them to the other side by clicking on the appropriate arrow. The program automatically filters out the elements whose parent – already available in the hierarchy above – is present.

For example if you mark all basic equipment and sites and move them to the right hand side of the window, after saving the modification only the ROOT object (the topmost) will remain in the right list.

9.8.3 High Availability Performance

StarQuality is able to provide high availability as a result of using measurement server groups. Different strategies must be applied depending on the number of machines serving StarQuality and its Oracle database. However, for all strategies except the non-measuring server components, it is recommended to install all components on the same machine with Oracle. The report and threshold modules can be relocated to another machine if there is enough capacity.



Chapter 10

Northbound Interface (NBI)

In this chapter

- “Introduction” on page 268
- “e-mail Notifications of StarQuality Server Events” on page 269
- “e-mail Notifications and Traps of Threshold Crossing Events” on page 270
- “SOAP Interface” on page 271

10.1 Introduction

The StarQuality Northbound Interface (NBI) functionality provides the following capabilities:

- Sending e-mail notifications to any number of recipients regarding server management events
- Sending e-mail notifications to any number of mail recipients and/or SNMP traps to any number of upper level management system (OSS) regarding threshold crossing events.
- Performing operations using the SOAP interface.

10.2 e-mail Notifications of StarQuality Server Events

The StarQuality server can be configured to send e-mail notifications to a list of recipients about various events occurring within the system. For example: server up/down, collection failure.

A prerequisite for the actual e-mail sending is the configuration of the StarQuality server with an active SMTP server as described in “Mail Server Configuration” on page 95, steps 2- 3.

10.3 e-mail Notifications and Traps of Threshold Crossing Events

10.3.1 e-Mail Notifications

A prerequisite to the actual e-mail sending is that the StarQuality server has been configure with an active SMTP server as described in “Mail Server Configuration” on page 95, Step 2 (PVSR_EMAIL_ADDRESS is not mandatory).

To set e-mail notifications:

1. In order to receive e-mail notifications, define the address list as described in “Setting E-mail Addresses (Admin only)” on page 243.
2. From the list, select the specific recipients for each threshold or threshold template as described in “Setting Alarm Thresholds” on page 165.

10.3.2 SNMP Trap Notifications

StarQuality Threshold Crossing Alerts (TCA) mechanism provides an interface From which SNMP traps can be sent to other management systems, in cases of actual threshold crossing events.

The traps are constructed according to the designated StarQuality MIB supplied with the installation CD, ready for uploading to any trap receiving management system.

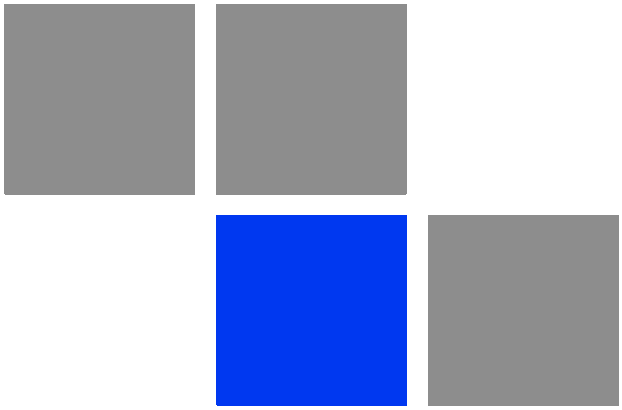
Trap can be sent to one or more recipients and with different timetables. Refer to “Setting Alarm Thresholds” on page 165.

10.4 SOAP Interface

StarQuality SOAP interface enables various NBI operations via third party applications.

A prerequisite for enabling SOAP operations is activation of the StarQuality SOAP server, as described in “Activating SOAP Server” on page 98.

For description and instructions on available operations, refer to the *StarQuality SOAP Manual*.



Chapter 11

Device Specific Information

In this chapter:

- "Introduction" on page 274
- "BreezeMAX FDD and TDD Equipment" on page 275
- "BreezeACCESS VL" on page 280
- "4Motion Ver.2.5" on page 287
- "4Motion Ver.3.0" on page 293
- "BreezeMAX Extreme" on page 307

11.1 Introduction

This chapter provides device specific information regarding software compatibility and limitations, traffic and performance counters, codes for thresholds and default built-in reports. This information may help you focus on the details required for each equipment type when using StarQuality.

KPIs (Key Performance Indicators) exist for three types of entities:

- Slot (also referred to as AU, sector, BS)
- SU (also referred to as MS, CPE)
- NPU (also referred to as BTS, in “common measurements”)

11.2 BreezeMAX FDD and TDD Equipment

11.2.1 Overview

- The information in this section is common to the following equipment types:
  - BreezeMAX FDD SNMP
  - BreezeMAX FDD
  - BreezeMAX TDD
- SW Compatibility:
  - FDD - 3.5/3.6 (SNMP based collection)
  - FDD 3.7
  - TDD - 4.5/4.6

  Refer to the Release Notes for specific Firmware versions.
- Collector type
  - FDD 3.5/3.6 - WiMAX FDD SNMP
  - FDD 3.7 - WiMAX FDD TFTP
  - TDD - WiMAX TDD

11.2.2 Network Discovery Prerequisites

Table 11-1: BTS Configuration Requirements

Requirement	FDD SNMP	FDD TFTP	TDD
Collection Interval Setting (rbCollectionStatisticsInterval)	900 sec.		
StarQuality registered as Authorised Manager (Traps disabled)	+	+	+
PM/TM Collection Activated		+	+ (Mode: Basic

Table 11-1: BTS Configuration Requirements (Continued)

Requirement	FDD SNMP	FDD TFTP	TDD
PM/TM Collection Contents			

11.2.3 Key Performance Indicators (KPIs)

11.2.3.1 BS KPIs

Each of the following is available for both Downlink (DL) and Uplink (UL):

Table 11-2: FDD and TDD Traffic BS KPIs

Counter	Description
Air Link Utilization (%) $Air\ Link\ Utilization\% = 100 \times \frac{Total\ symbols\ Qty\ used}{Total\ symbols\ available}$	The utilization of available wireless link resources: Total used symbols during the collection period as a percentage of total symbols available.
Subscription (%) Subscription (%) = ■ If Constant throughput >0 then $100 \times \frac{Throughput - Const\ throughput}{\Sigma(CIR\&MIR)}$ ■ Otherwise $100 \times \frac{Throughput}{\Sigma(CIR\&MIR)}$ $Constant\ throuput = Throuput - \Sigma(CIR\&MIR)$	The throughput (based on the total traffic rate taking into account the unusable gap period in each frame) as a percentage of total provisioned MIR. The higher this value, the higher is the actual utilization by users of the provisioned MIR.
MIR+CIR Allocated (bits per second) $\Sigma MIRCIR = \sum_{Start\_time\_quarter}^{Stop\_time\_quarter} \times 1000 \times \frac{Provisioned\ MIR\ for\ BE\ and\ nRT\ registered + Provisioned\ CIR\ for\ RT\ \&\ CG\ registered}{\frac{Stop\_time - Start\_time}{15min}[bps]}$	The total Maximum Information Rate (MIR for all BE and NRT services and CIR for RT and CG services) provisioned to connected SUs.
CIR Allocated (bits per second)	The Committed Information Rate (CIR for NRT, RT and CG services) provisioned to SUs connected to the AU/FDD Micro Base Station.

Table 11-2: FDD and TDD Traffic BS KPIs

Counter	Description
$\Sigma CIR = \sum_{Start\_time\_quarter}^{Stop\_time\_quarter} \times 1000 \times \frac{Provisioned\ CIR\ for\ nRT\ and\ CG\ registered}{\frac{Stop\_time - Start\_time}{15min}} [bps]$	
Throughput (bits per second) $\Sigma Rate = Throughput = \frac{Total\ symbols\ used\ in\ bytes\ considering\ rate \times 8}{\frac{Stop\_time - Start\_time}{15min} \times (Total\ symbols\ available \times T\_symbol)} [bps]$	Total symbols used.
Total Used Capacity Rate (bps) Calculation formula per each rate: $\sum_{Start\_time\_quarter}^{Stop\_time\_quarter} \frac{(Symbols[Ra] \times b) \times 8}{Total\ symbols\ available \times T\_symbol\ [bps]}$ When: a - modulation rate b - bytes per symbol for this modulation rate	Throughput of each MCS for the uplink and downlink directions
Number of connected SUs	SUs with active services

11.2.3.2 SU KPIs

Performance KPIs include the uplink/downlink RSSI (Received Signal Strength Indicator), SNR (Signal to Noise Ration) and modulation rate (from rate 1 (BPSK 1/2] to rate 8 [64QAM 3/4]) measurements for all SUs.

Note the following regarding FDD ver3.5/3.6 SUs (SNMP based data collection):

- The number of SUs is limited to 10 per BTS
- Only a single value per each counter is displayed according to its value at the time of sampling.

Table 11-3: FDD/TDD Performance Counters (File Collection)

Counter	Description
Uplink RSSI Average/Max/Min (dBm)	The average/maximum/minimum RSSI value of the signal from the SU measured at the AU/FDD Micro Base Station for the past 15 minutes. In TDD there is only Average.
Downlink RSSI Average/Max/Min (dBm)	The average/maximum/minimum RSSI value of the signal from the AU measured at the SU (and reported over the air to the Base Station equipment) for the past 15 minutes. In TDD there is only Average..
Uplink SNR Average/Max/Min (dB)	The average/maximum/minimum SNR value of the signal from the SU measured at the AU/FDD Micro Base Station for the past 15 minutes.
Downlink SNR Average/Max/Min (dB)	The Average/maximum/minimum SNR value of the signal from the AU measured at the SU (and reported over the air to the Base Station equipment) for the past 15 minutes.
Uplink Rate Average/Max/Min	From rate 1 (BPSK 1/2) to rate 8 (64QAM 3/4)
Downlink Rate Average/Max/Min	From rate 1 (BPSK 1/2) to rate 8 (64QAM 3/4)
Uptime	BTS uptime in seconds

11.2.3.3 Common/BTS KPIs

Uptime

11.2.4 Codes for Threshold Setting

Table 11-4: Syntax for TDD/FDD AU Measurements

Description	Parameter		
	FDD 35 (SNMP)	FDD TFTP	TDD
Total Used Capacity Rate 1	WCR1	FCR1	TCR1
Total Used Capacity Rate 2	WCR2	FCR2	N/A
Total Used Capacity Rate 3	WCR3	FCR3	TCR3
Total Used Capacity Rate 4	WCR4	FCR4	TCR4
Total Used Capacity Rate 5	WCR5	FCR5	TCR5
Total Used Capacity Rate 6	WCR6	FCR6	TCR6
Total Used Capacity Rate 7	WCR7	FCR7	TCR7
Total Used Capacity Rate 8	WCR8	FCR8	TCR8
Subscription	WMP	FMP	TMP

Table 11-4: Syntax for TDD/FDD AU Measurements (Continued)

Description	Parameter		
	FDD 35 (SNMP)	FDD TFTP	TDD
Air Link Occupation	WOCC	FOCC	TOCC
CIR Allocated	WPC	FPC	TPC
MIR+CIR Allocated	WPM	FPM	TPM
Throughput	WT	FT	TT
Number Of Connected SUs	WCS	FCS	TCS

Table 11-5: Syntax for TDD/FDD SU Measurements

Description	Parameter		
	FDD 35 (SNMP)	FDD TFTP	TDD
Rate max	WSU3	FSU8	TSU6
Rate average		FSU9	TSU7
Rate min		FSU7	TSU5
SNR max	WSU1	FSU5	TSU2
SNR average		FSU6	TSU3
SNR min		FSU4	TSU1
RSSI max	WSU2	FSU2	TSU4
RSSI average		FSU3	
RSSI min		FSU1	

11.2.5 Default Built-in Reports

- BottomN Uptime
- TopN Air Link Utilization
- TopN Throughput
- TopN Number of Connected SUs

11.3 BreezeACCESS VL

11.3.1 Overview

SW Compatibility: Version 6.0. (Up to 10 SUs per BTS can be measured)

Collector type - WiMAX VL

11.3.2 Network Discovery Prerequisites

- StarQuality registered as Authorised Manager (Traps disabled)
- PM/TM Collection Activated

11.3.3 Key Performance Indicators (KPIs)

11.3.3.1 BS KPIs

Table 11-6: BreezeACCESS VL Traffic Counters

Counter	Description
Concatenated Frames Received (frames per second)	The total number of concatenated frames received from the wireless medium, including duplicate frames. There are also separate counts for concatenated frames that include one frame (Single), two frames (Double) or more than two frames (More).
Concatenated Frames Transmitted (frames per second)	The total number of concatenated frames transmitted successfully to the wireless medium, excluding retransmissions. There are also separate counts for concatenated frames that include one frame (Single), two frames (Double) or more than two frames (More).

Table 11-6: BreezeACCESS VL Traffic Counters (Continued)

Counter	Description
Errors Received (frames per second)	■ Phy - The number of Physical errors (unidentified signals). ■ CRC - The number of frames received from the wireless medium containing CRC errors. ■ Overrun - The number of frames that were discarded because the receive rate exceeded the processing capability or the capacity of the Ethernet port. ■ Decrypt - The number of frames that were not received properly due to a problem in the data decryption mechanism. ■ Other - Errors other than previous counters. ■ Duplicate Frames Discarded - The number of data frames discarded because multiple copies were received. If an acknowledgement message is not received by the originating unit, the same data frame can be received more than once. Although duplicate frames are included in all counters that include data frames, only the first copy is forwarded to the Ethernet port.
Errors Transmitted (frames per second)	■ Frames dropped (too many retries) - The number of dropped frames, which are unsuccessfully retransmitted without being acknowledged until the maximum permitted number of retransmissions. ■ Underrun Events - The number of times that transmission of a frame was aborted because the rate of submitting frames for transmission exceeds the available transmission capability. ■ Other TX Events - The number of frames whose transmission was not completed or delayed due to a problem other than those represented by the other counters. ■ Internally discarded MIR/CIR - The number of data frames received from the Ethernet port that were discarded by the MIR/CIR mechanism to avoid exceeding the maximum permitted information rate.
Frames Received (frames per second)	The total number of data frames received from the wireless medium, including duplicate frames.
Frames Transmitted (frames per second)	The total number of data frames submitted to the internal bridge for transmission to the wireless medium. The count does not include control and wireless management frames, or retransmissions. There are also separate counts for each priority queue through which the frames were routed (High, Mid and Low).

Table 11-6: BreezeACCESS VL Traffic Counters (Continued)

Counter	Description
Wireless Frames Received (frames per second)	The total number of frames received from the wireless medium. The count includes data frames as well as control and wireless management frames. The count does not include bad frames and duplicate frames.
Wireless Frames Transmitted (frames per second)	The number of frames transmitted to the wireless medium. The total includes one count for each successfully transmitted unicast frame (excluding retransmissions), and the number of transmitted multicast and broadcast frames, including control and wireless management frames.
CIR Allocated (Bits per second)	The sum of allocated CIR (Committed Information Rate) Downlink/Uplink values for all the SUs in the sector.
Ethernet Throughput (bits per second)	The average throughput per second on the Ethernet port on Downlink/Uplink direction.
MIR Allocated (bits per second)	The sum of allocated MIR (Maximum Information Rate) Downlink/Uplink values for all the SUs in the sector.
Noise Floor (dBm)	The average Noise Floor recorded by the unit.
Number of Connected SUs	SUs with active services
Retransmission (%)	The percentage of total number of retransmissions, including all unsuccessful transmissions and retransmissions, out of the total number of unicast frames transmitted over the wireless port.
Throughput (bits per second)	The average throughput per second on the Radio port on Downlink/Uplink direction.
Uptime (hours)	BS uptime in hours

11.3.3.2 SU KPIs

Table 11-7: BreezeACCESS VL Performance Counters

Counter	Description
Concatenated Frames, Receive (frames per second)	The total number of concatenated frames received from the wireless medium, including duplicate frames. There are also separate counts for concatenated frames that include one frame (Single), two frames (Double) or more than two frames (More).
Concatenated Frames ,Transmit (frames per second)	The total number of concatenated frames transmitted successfully to the wireless medium, excluding retransmissions. There are also separate counts for concatenated frames that include one frame (Single), two frames (Double) or more than two frames (More).

Table 11-7: BreezeACCESS VL Performance Counters (Continued)

Counter	Description
Errors Received (frames per second)	■ Phy - The number of Physical errors (unidentified signals). ■ CRC - The number of frames received from the wireless medium containing CRC errors. ■ Overrun - The number of frames that were discarded because the receive rate exceeded the processing capability or the capacity of the Ethernet port. ■ Decrypt - The number of frames that were not received properly due to a problem in the data decryption mechanism. ■ Other - Receive errors other than previous counters. ■ Duplicate frames discarded -The number of data frames discarded because multiple copies were received. If an acknowledgement message is not received by the originating unit, the same data frame can be received more than once. Although duplicate frames are included in all counters that include data frames, only the first copy is forwarded to the Ethernet port.
Errors Transmitted (frames per second)	■ Frames dropped (too many retries) - The number of dropped frames, which are unsuccessfully retransmitted without being acknowledged until the maximum permitted number of retransmissions. ■ Underrun Events - The number of times that transmission of a frame was aborted because the rate of submitting frames for transmission exceeds the available transmission capability. ■ Other TX Events - The number of frames whose transmission was not completed or delayed due to a problem other than those represented by the other counters. ■ Internally discarded MIR/CIR - The number of data frames received from the Ethernet port that were discarded by the MIR/CIR mechanism to avoid exceeding the maximum permitted information rate.
Ethernet Throughput (bits per second)	The average throughput per second on the Ethernet port on Downlink/Uplink direction.
Frames Received (frames per second)	The total number of data frames received from the wireless medium, including duplicate frames.
Frames Submitted (frames per second)	The total number of data frames submitted to the internal bridge for transmission to the wireless medium. The count does not include control and wireless management frames, or retransmissions. There are also separate counts for each priority queue through which the frames were routed (High, Mid and Low).

Table 11-7: BreezeACCESS VL Performance Counters (Continued)

Counter	Description
Noise Floor (dBm)	The average Noise Floor recorded by the unit.
Retransmission (%)	The percentage of total number of retransmissions, including all unsuccessful transmissions and retransmissions, out of the total number of unicast frames transmitted over the wireless port.
Downlink RSSI (dBm)	Downlink RSSI value as measured in the time of sampling
Downlink SNR (dB)	Downlink SNR value as measured at the time of sampling
Throughput (bits per second)	Sector throughput as measured at the time of sampling
Uptime (hours)	CPE uptime in hours
Wireless Frames (frames per second)	The number of frames transmitted to the wireless medium. The total includes one count for each successfully transmitted unicast frame (excluding retransmissions), and the number of transmitted multicast and broadcast frames, including control and wireless management frames.

11.3.4 Codes for Threshold Setting

Table 11-8: Syntax for BreezeACCESS VL AU Measurements

Description	Parameter
Concatenated Frames Single	VCFS
Concatenated Frames Double	VCFD
Concatenated Frames More	VCFM
Concatenated Frames Total	VCFT
Errors Receive CRC	VERC
Errors Receive Decrypt	VERD
Errors Receive Duplicate frames discarded	VERd
Errors Receive Other	VERo
Errors Receive Overrun	VERO
Errors Receive Phy	VERP
Errors Transmit Frames dropped (too many retries)	VETD
Errors Transmit Internally discarded MIR/CIR	VETI
Errors Transmit Other TX Events	VETO
Errors Transmit Underrun Events	VETU
Frames Received - Total	VFRT

Table 11-8: Syntax for BreezeACCESS VL AU Measurements (Continued)

Description	Parameter
Frames Submitted High	VFSH
Frames Submitted Low	VFSL
Frames Submitted Mid	VFSM
Frames Submitted Total	VFST
Wireless Frames Received	VWFR
Wireless Frames Submitted Beacons	VWFB
Wireless Frames Submitted OtherMng and Data	VWFO
Wireless Frames Submitted Total	VWFT
CIR Allocated	VCA
Ethernet Throughput	VETH
MIR Allocated	VMA
Noise Floor	VNF
Number Of Connected SUs	VCS
Retransmission	VR
Throughput	VTHR
Uptime	VUPT
RSSI	VRSS

Table 11-9: Syntax for BreezeACCESS VL SU Measurements

Description	Parameter
Concatenated Frames Single	VCFS
Concatenated Frames Double	VCFD
Concatenated Frames More	VCFM
Concatenated Frames Total	VCFT
Errors Receive CRC	VERC
Errors Receive Decrypt	VERD
Errors Receive Duplicate frames discarded	VERd
Errors Receive Other	VERo
Errors Receive Overrun	VERO
Errors Receive Phy	VERP
Errors Transmit Frames dropped (too many retries)	VETD

Table 11-9: Syntax for BreezeACCESS VL SU Measurements (Continued)

Description	Parameter
Errors Transmit Internally discarded MIR/CIR	VETI
Errors Transmit Other TX Events	VETO
Errors Transmit Underrun Events	VETU
Frames Received - Total	VFRT
Frames Submitted High	VFSH
Frames Submitted Low	VFSL
Frames Submitted Mid	VFSM
Frames Submitted Total	VFST
Ethernet Throughput	VETH
Noise Floor	VNF
Retransmission	VRSU
RSSI	VRSS
SNR	VSNR
Throughput	VTHR
Uptime	VUPT
Wireless Frames	VWF

11.3.5 Default Built-in Reports

- BottomN Uptime
- TopN Throughput
- TopN Number of Connected SUs

11.4 4Motion Ver.2.5

11.4.1 Overview

SW Compatibility - Versions 2.5M1 and 2.5M1

Refer to the release notes for details.

Collector type - WiMAX 4Motion

11.4.2 Network Discovery Prerequisites

- PM/TM Collection Contents - All Management > Performance Categories checked
- For MS data - check “All MS Basic Data” (it is not checked by default)

11.4.3 Key Performance Indicators (KPIs)

11.4.3.1 BS KPIs

Table 11-10: Traffic Counters 4Motion Ver.2.5

Counter	Members	Description
Air Link Utilization (%)	All UL Data Zone DL Data Zone DL Map Zone	The utilization of available wireless link resources: Data utilization from all slots (including MAP, not including preamble and TTG/RTG) per BS as a percentage of total slots available for the uplink and downlink directions.
MAP Size Distribution (Frames)	2 Symbols 4 Symbols 6 Symbols 8 Symbols 10 Symbols > 10 Symbols	Number of frames per number of symbols per BS for the downlink direction.
MCS Distribution Downlink (Bits per Second) MCS Distribution Uplink (Bits per Second)	19 MCS values from QPSK 1/2 rep 6 To 64 QAM 1/2 MIMO B	Throughput of each MCS for the uplink and downlink directions

Table 11-10: Traffic Counters 4Motion Ver.2.5 (Continued)

Counter	Members	Description
Retransmission Downlink (HARQ Sub Bursts)	Total 0 Retransmissions 1 Retransmission 2 Retransmissions 3 Retransmissions 4 Retransmissions > 4 Retransmissions	Number of transactions with a certain number of retransmissions per BS for the downlink direction.
SINR Distribution Downlink (%)	< 3 dB 3 – 9 dB 9 – 13 dB 13 – 17 dB 17 – 21 dB > 21 dB	Percentages of CPEs per SINR range for downlink per bs.
SINR Distribution Uplink (%)	< 3 dB 3 – 7 dB 7 – 11 dB 11 – 15 dB 15 – 19 dB > 19 dB	Percentages of CPEs per SINR range for Uplink per bs.
Spectral Efficiency of all MS (Bits/Bin)	Average UL Average DL Max UL Max DL	Peak and average spectral efficiency values for all MSs in a BS for both downlink and uplink directions.
Throughput (Bits per Second)	UL Throughput DL Total DL MIMO A/BF DL MIMO B	Average sector throughput per BS (each measurement represents the average throughput of the passed sampling interval of 15 minutes).

Table 11-10: Traffic Counters 4Motion Ver.2.5 (Continued)

Counter	Members	Description
Uplink HARQ Packet Error Rate (Dropped HARQ Sub Bursts)	11 MCS values from QPSK 1/2 Rep 6 To 64 QAM 5/6 And Total	Error rate of dropped packets after HARQ of each MCS per BS for the uplink direction.
Number Of Connected SUs (Count)	Value	Number of SUs that have been connected to the BS, for the whole 15 minute interval proceeding the PMTM file generation.
UL Noise (Median) (dBm)	Uplink	The median extracted from the actual noise flow histogram

11.4.3.2 4Motion 2.5M BTS KPIs

Table 11-11: Common Measurements for 4Motion BTS

Counter	Description
Uptime	BTS uptime in seconds
Average Backhaul Traffic (bits per second)	Average data throughput (user IP packets) in both the downlink or uplink direction including: backhaul, bearer, external management, internal management and cascading

11.4.3.3 MS KPIs

Table 11-12: Performance Counters Per MS

Counter	Description
Average Spectral Efficiency (bits/bin)	Average spectral efficiency values for both the downlink and uplink directions.
CINR (db)	Min, max and average values for the downlink and uplink directions
MCS (bits/slot) (slot efficiency)	Min, max and average Number of bits per slot for uplink and downlink directions
RSSI Uplink (dBm)	Min, max and average values

11.4.4 Codes for Threshold Setting

Table 11-13: Syntax for 4Motion BS Measurements

Description	Parameter
Throughput	4AST
Average Spectral Efficiency all MSs	4SEA
DL Retransmission, Above Four Retransmissions	4DR6
DL Retransmission, Four Retransmissions	4DR5
DL Retransmission, One Retransmission	4DR2
DL Retransmission, Three Retransmissions	4DR4
DL Retransmission, Two Retransmissions	4DR3
DL Retransmission, Zero Retransmission	4DR1
DL SINR Distribution, 11dB < SINR < 13dB	4SD3
DL SINR Distribution, 15dB < SINR < 17dB	4SD4
DL SINR Distribution, 19dB < SINR < 21dB	4SD5
DL SINR Distribution, 23dB < SINR < 25dB	4SD6
DL SINR Distribution, 5dB < SINR < 9dB	4SD2
DL SINR Distribution, SINR < 5dB	4SD1
DL Slot Utilization, Data Zone	4UD1
DL Slot Utilization, Map Zone	4UD2
HARQ Packet Error Rate PER 16QAM 1/2	4E06
HARQ Packet Error Rate PER 16QAM 3/4	4E07
HARQ Packet Error Rate PER 64QAM 1/2	4E08
HARQ Packet Error Rate PER 64QAM 2/3	4E09
HARQ Packet Error Rate PER 64QAM 3/4	4E10
HARQ Packet Error Rate PER 64QAM 5/6	4E11
HARQ Packet Error Rate PER QPSK 1/2	4E04
HARQ Packet Error Rate PER QPSK 1/2 Rep 2	4E03
HARQ Packet Error Rate PER QPSK 1/2 Rep 4	4E02
HARQ Packet Error Rate PER QPSK 1/2 Rep 6	4E01
HARQ Packet Error Rate PER QPSK 3/4	4E05
HARQ Packet Error Rate Percent	4E00
MAP Length Eight Symbols	4MS4

Table 11-13: Syntax for 4Motion BS Measurements (Continued)

Description	Parameter
MAP Length Four Symbols	4MS2
MAP Length More Than Ten Symbols	4MS6
MAP Length Six Symbols	4MS3
MAP Length Ten Symbols	4MS5
MAP Length Two Symbols	4MS1
MCS Distribution 16QAM 1/2	4D06
MCS Distribution 16QAM 3/4	4D07
MCS Distribution 64QAM 1/2	4D08
MCS Distribution 64QAM 2/3	4D09
MCS Distribution 64QAM 3/4	4D10
MCS Distribution 64QAM 5/6	4D11
MCS Distribution QPSK 1/2	4D04
MCS Distribution QPSK 1/2 Rep 2	4D03
MCS Distribution QPSK 1/2 Rep 4	4D02
MCS Distribution QPSK 1/2 Rep 6	4D01
MCS Distribution QPSK 3/4	4D05
Max Spectral Efficiency all MSs	4SEM
Number Of Connected SUs	4CS
Slot Utilization ALL	4UA
UL Noise (99th Percentile)	4UN1
UL Noise (Median)	4UN2
UL SINR Distribution, 17dB < SINR < 21dB	4SU4
UL SINR Distribution, 5dB < SINR < 9dB	4SU2
UL SINR Distribution, 9dB < SINR < 13dB	4SU3
UL SINR Distribution, SINR < 5dB	4SU1
UL SINR Distribution, SINR > 21dB	SU6
UL Slot Utilization, Data Zone	4UU1
UL Slot Utilization, Feedback Zone	4UU2

Table 11-14: Syntax for 4Motion Common Measurements

Description	Parameter
Uptime	4UPT
cntNpuBckhlPort	4NT5
cntNpuBearer	4NT1
cntNpuCascPort	4NT4
cntNpuExtMgmt	4NT2
cntNpuIntMgmt	4NT3

Table 11-15: Syntax for 4Motion SU Measurements

Description	Parameter
CINR Average	4SU3
CINR Max	4SU2
CINR Min	4SU1
MCS Average	4SU6
MCS Max	4SU5
MCS Min	4SU4
Uplink RSSI Average	4SU9
Uplink RSSI Max	4SU8
Uplink RSSI Min	4SU7
Average Spectral Efficiency	4SU0

11.4.5 Default Built-in Reports

- BottomN Uptime
- TopN Air Link Utilization
- TopN Average Sector Throughput
- TopN Number of Connected SUs

11.5 4Motion Ver.3.0

11.5.1 Overview

SW Compatibility - Versions 3.0

Refer to the release notes for details.

Collector type - WiMAX 4Motion

11.5.2 Network Discovery Prerequisites

- PM/TM Collection Contents - All Management > Performance Categories checked
- For MS data - check “All MS Basic Data” (it is not checked by default)

11.5.3 Key Performance Indicators (KPIs)

11.5.3.1 BS KPIs

Table 11-16: Traffic Counters 4Motion Ver.3.0

Counter	Members	Description
Active MS / Idle MS / Registered MS (count)	Registered MSs Qty Idle MSs Qty Active MSs Qty	The MSs are sampled at the end of the 15 Min sample period
Active MS / Idle MS Ratio (%)	Idle MSs Ratio Active MSs Ratio	Ratio of gauges mentioned above
Air Link Utilization (%)	All UL Data Zone DL Data Zone DL Map Zone	The utilization of available wireless link resources: Data utilization from all slots (including MAP, not including preamble and TTG/RTG) per BS as a percentage of total slots available for the uplink and downlink directions.

Table 11-16: Traffic Counters 4Motion Ver.3.0 (Continued)

Counter	Members	Description
Average Provisioned Downlink (bits per second)	RT CIR RT MIR UGS CIR eRT CIR eRT MIR nRT CIR nRT MIR BE MIR	Counts the provisioned DL based on registered MSs per second. The graphs are per QoS. The calculation divides the accumulated value with 900 seconds.
Average Provisioned Uplink (bits per second)	BE MIR RT CIR RT MIR UGS CIR eRT CIR eRT MIR nRT CIR nRT MIR	Counts the provisioned UL based on registered MSs per second. The graphs are per QoS. The calculation divides the accumulated value with 900 seconds.
BS Traffic Type (%)	DL MIMO A Ratio DL MIMO B Ratio DL MIMO CDD Ratio DL MIMO BF Ratio	Ratio is based on number of bursts counted in the sampled period
Burst Error Rate Downlink (count)	Succeeded transfer Qty Dropped Qty Repetitions	Counts the actual numbers of bursts in the sampled period
Burst Error Rate Ratio Downlink (%)	Succeeded Transfer Ratio Drop Ratio Repetition Ratio	Ratio is based on number of bursts counted in the sampled period

Table 11-16: Traffic Counters 4Motion Ver.3.0 (Continued)

Counter	Members	Description
Burst Error Rate Ratio Uplink (%)	Succeeded Transfer Ratio Drop Ratio Repetition Ratio	Ratio is based on number of bursts counted in the sampled period
Burst Error Rate Uplink (count)	Succeeded transfer Qty Dropped Qty Repetitions	Counts the actual numbers of bursts in the sampled period
MAP Size Distribution (Frames)	2 Symbols 4 Symbols 6 Symbols 8 Symbols 10 Symbols > 10 Symbols	Number of frames per number of symbols per BS for the downlink direction.
MCS Distribution Downlink (Bits per Second) MCS Distribution Uplink (Bits per Second)	19 MCS values from QPSK 1/2 rep 6 To 64 QAM 1/2 MIMO B	Throughput of each MCS for the uplink and downlink directions
MS Hand Over (Count)	Succeeded HO Attempts Failed HO Attempts	Counts number handover attempts both in and out
Hand Over Ratio (%)	Succeeded Attempts Ratio HO Attempts Ratio Failed Attempts Ratio	Ratio calculation of counters mentioned above
MS Registration (Count)	Created Service Flow Qty Failed Initial NE Succeeded initial NE	Number of initial network entry attempts sampled
Registration Ratio (%)	Succeeded Service Flow Ratio Failed Initial NE Ratio Succeeded initial NE Ratio	Ratio of counters mentioned above

Table 11-16: Traffic Counters 4Motion Ver.3.0 (Continued)

Counter	Members	Description
Retransmission Downlink (HARQ Sub Bursts)	Total 0 Retransmissions 1 Retransmission 2 Retransmissions 3 Retransmissions 4 Retransmissions > 4 Retransmissions	Number of transactions with a certain number of retransmissions per BS for the downlink direction.
SINR Distribution Downlink (%)	< 3 dB 3 – 9 dB 9 – 13 dB 13 – 17 dB 17 – 21 dB > 21 dB	Percentages of CPEs per SINR range for downlink per bs.
SINR Distribution Uplink (%)	< 3 dB 3 – 7 dB 7 – 11 dB 11 – 15 dB 15 – 19 dB > 19 dB	Percentages of CPEs per SINR range for Uplink per bs.
Spectral Efficiency of all MS (Bits/Bin)	Average UL Average DL Max UL Max DL	Peak and average spectral efficiency values for all MSs in a BS for both downlink and uplink directions.
Throughput (Bits per Second)	UL Throughput DL Total DL MIMO A/BF DL MIMO B	Average sector throughput per BS (each measurement represents the average throughput of the passed sampling interval of 15 minutes).

Table 11-16: Traffic Counters 4Motion Ver.3.0 (Continued)

Counter	Members	Description
Uplink HARQ Packet Error Rate (Dropped HARQ Sub Bursts)	11 MCS values from QPSK 1/2 Rep 6 To 64 QAM 5/6 And Total	Error rate of dropped packets after HARQ of each MCS per BS for the uplink direction.
MIR + CIR Provisioned (Bits per Second)	Uplink Downlink	This KPI shows aggregation of maximum provisioned traffic during the 15 minutes period. Value is calculated based on aggregation of
Number Of Connected SUs (Count)	Value	Number of SUs that have been connected to the BS, for the whole 15 minute interval proceeding the PMTM file generation.
UL Noise (Median) (dBm)	Uplink	The median extracted from the actual noise flow histogram

11.5.3.2 NPU KPIs

There are KPIs that are relevant only for NPUs working in non-transparent mode. You can find the items relevant for non-transparent mode in the release notes.

Table 11-17: NPU Counters

Counter	Members	Description	Comments
ASN GW - MS Registration (Count)	Authentication Rejections Created Service Flows Qty Failed Initial NE Max Registered MSs Min Registered MSs Registered MSs Qty Succeeded Initial NE	Sample of MSs in ASNGW in 15 min Min and Max shows the tide mark in 15 min duration	ASNGW KPI

Table 11-17: NPU Counters (Continued)

Counter	Members	Description	Comments
Average Backhaul Traffic (Bits per Second)	cntNpuBckhlPort in cntNpuBckhlPort out cntNpuBearer in cntNpuBearer out cntNpuCascPort in cntNpuCascPort out cntNpuExtMgmt in cntNpuExtMgmt out cntNpuIntMgmt in cntNpuIntMgmt out	Average data throughput (user IP packets) in both the downlink or uplink direction including: backhaul, bearer, external management, internal management and cascading	ASNGW KPI
Authentication Reject Ratio (%)	Value	Ratio of auth. Rejection in respect of successful INE	ASNGW KPI
NE failure Ratio (%)	Value	Ratio of failed INE in respect to successful INE	ASNGW KPI
R3 CIR Throughput Oversubscription (%)	Uplink Downlink	Ratio is a calculation of average actual traffic rate over R3 in respect to total provisioned CIR in %	ASNGW KPI
R3 MIR Throughput Oversubscription (%)	Uplink Downlink	Ratio is a calculation of average actual traffic rate over R3 in respect to total provisioned MIR in %	ASNGW KPI
R3 Throughput (Bits per Second)	Uplink Downlink	Average total bytes transferred over R3 with the active period to show average rate over R3	ASNGW KPI
R3 Total CIR (Bits per Second)	Uplink Downlink	Average over 15 min period based on aggregation of CIR from all served BSs	ASNGW KPI

Table 11-17: NPU Counters (Continued)

Counter	Members	Description	Comments
R3 Total MIR (Bits Per Second)	Uplink Downlink	Average over 15 min period based on aggregation of MIR from all served BSs	ASNGW KPI
R6 CIR Throughput Oversubscription (%)	Uplink Downlink	Average over 15 min period based on aggregation of CIR from all served BSs	ASNGW KPI
R6 MIR Throughput Oversubscription (%)	Uplink Downlink	Average over 15 min period based on aggregation of MIR from all served BSs	ASNGW KPI
R6 CIR Throughput Oversubscription (%)	Uplink Downlink	Ratio is a calculation of average actual traffic rate over R6 in respect to total provisioned CIR in %	ASNGW KPI
R6 MIR Throughput Oversubscription (%)	Uplink Downlink	Ratio is a calculation of average actual traffic rate over R6 in respect to total provisioned MIR in %	ASNGW KPI
R6 Throughput (Bits per Second)	Uplink Downlink	Average total bytes transferred over R3 with the active period to show average rate over R6	ASNGW KPI
R6 Total CIR (Bits per Second)	Uplink Downlink	Average over 15 min period based on aggregation of CIR from all served BSs	ASNGW KPI
R6 Total MIR (Bits per Second)	Uplink Downlink	Average over 15 min period based on aggregation of MIR from all served BSs	ASNGW KPI
Service Flow usage Ratio (%)	Value	Ratio shows number of service flows in respect to maximum allowed of 36000 service flows	ASNGW KPI
Uptime (hours)	NPU uptime	Time of system up	

11.5.3.3 MS KPIs

Table 11-18: MS Counters

Counter	Members	Description
MCS Downlink (Bit/Bin)	Min/Max/Average	Counts bit/bin for each MS transaction. Min and max are calculated by BS. Average is calculated by dividing by number of samples
MCS Uplink (Bit/Bin)	Min/Max/Average	Counts bit/bin for each MS transaction. Min and max are calculated by BS. Average is calculated by dividing by number of samples
MS Burst Error Rate Downlink (Count)	Succeeded transferred Qty Dropped Bursts Qty Repetitions	Counts HARQ bursts of ACK, dropped and total
MS Burst Error Rate Ratio Downlink (%)	Succeeded Transfer Ratio Drop Ratio Repetition Ratio	Ratio based on above counters
Burst Error Rate Ratio Uplink (%)	Succeeded Transfer Ratio Drop Ratio Repetition Ratio	Counts HARQ bursts of ACK, dropped and total
MS Burst Error Rate Uplink (Count)	Succeeded transferred Qty Dropped Bursts Qty Repetitions	Ratio based on above counters
RSSI Uplink (dBm)	Min/Max/Average	RSSI is sampled from each burst Min and max are calculated by BS. Average is calculated by dividing by number of samples
Aggregated Throughput (Bits per Second)	Uplink Downlink	Counts the bytes transferred and calculates the transferred rate normalized to the active frames MS transferred data.
SINR Avg (dB)	Uplink Downlink	CINR in db average to the number of sampled bursts
Total Transferred Bursts (Bits per Second)	Downlink	Total burst transmitted including MIMO B and MIMO AB

11.5.4 Codes for Threshold Setting

11.5.4.1 BS Codes

Table 11-19: 4Motion BS Threshold Codes

Code	Parameter
Active MS Qty	#4021
Active MS Ratio	#4033
Additional Provisionable Bit Rate	#4AP
Air Link Utilization ALL	#4UA
Authentication Reject Ratio	#4NTh
Authentication Rejections	#4NTo
Average Provisioned BE MIR	#4041
Average Provisioned RT CIR	#4037
Average Provisioned RT MIR	#4038
Average Provisioned UGS CIR	#4034
Average Provisioned eRT CIR	#4035
Average Provisioned eRT MIR	#4036
Average Provisioned nRT CIR	#4039
Average Provisioned nRT MIR	#4040
Average Sector Throughput	#4AST
Average Sector Throughput MIMO A/BF	#4AS1
Average Sector Throughput MIMO-B	#4AS2
Average Spectral Efficiency all MSs	#4SEA
CQI channels	#4017
CQI channels utilization Ratio	#4001
Created Service Flows Qty	#4NTp
Created Service Flows Qty	#4025
Created Service Flows Qty Ratio	#4005
DL Air Link Utilization, Data Zone	#4UD1
DL Air Link Utilization, Map Zone	#4UD2
DL MIMO A Ratio	#4006
DL MIMO B Ratio	#4007
DL MIMO BF Ratio	#4009

Table 11-19: 4Motion BS Threshold Codes (Continued)

Code	Parameter
DL MIMO CDD Ratio	#4008
DL Retransmission, Above Four Retransmissions	#4DR6
DL Retransmission, Four Retransmissions	#4DR5
DL Retransmission, One Retransmission	#4DR2
DL Retransmission, Three Retransmissions	#4DR0
DL Retransmission, Two Retransmissions	#4DR3
DL Retransmission, Zero Retransmission	#4DR1
DL SINR Distribution, SINR 13dB till 17dB	#4SD4
DL SINR Distribution, SINR 17dB till 21dB	#4SD5
DL SINR Distribution, SINR 3dB till 9dB	#4SD2
DL SINR Distribution, SINR 9dB till 13dB	#4SD3
DL SINR Distribution, SINR > 21dB	#4SD6
DL SINR Distribution, SINR Below 3dB	#4SD1
Drop Ratio	#4012
Dropped Bursts Qty	#4027
Failed Ho Attempts	#4030
Failed Ho Attempts Ratio	#4016
Failed Initial NE	#4NTn
Failed Initial NE	#4023
Failed Initial NE Ratio	#4003
Gross Idle Entries	#4031
Ho Attempts Ratio	#4015
Idle MSs Qty	#4020
Idle MSs Ratio	#4032
MAP Length Eight Symbols	#4MS4
MAP Length Four Symbols	#4MS2
MAP Length More Than Ten Symbols	#4MS6
MAP Length Six Symbols	#4MS3
MAP Length Ten Symbols	#4MS5
MAP Length Two Symbols	#4MS1
MCS Distribution 16QAM 1/2	#4D06

Table 11-19: 4Motion BS Threshold Codes (Continued)

Code	Parameter
MCS Distribution 16QAM 1/2 MIMO B	#4D14
MCS Distribution 16QAM 3/4	#4D07
MCS Distribution 16QAM 3/4 MIMO B	#4D15
MCS Distribution 64QAM 1/2	#4D08
MCS Distribution 64QAM 1/2 MIMO B	#4D16
MCS Distribution 64QAM 2/3	#4D09
MCS Distribution 64QAM 2/3 MIMO B	#4D17
MCS Distribution 64QAM 3/4	#4D10
MCS Distribution 64QAM 3/4 MIMO B	#4D18
MCS Distribution 64QAM 5/6	#4D11
MCS Distribution 64QAM 5/6 MIMO B	#4D19
MCS Distribution QPSK 1/2	#4D04
MCS Distribution QPSK 1/2 MIMO B	#4D12
MCS Distribution QPSK 1/2 Rep 2	#4D03
MCS Distribution QPSK 1/2 Rep 4	#4D02
MCS Distribution QPSK 1/2 Rep 6	#4D01
MCS Distribution QPSK 3/4	#4D05
MCS Distribution QPSK 3/4 MIMO B	#4D13
MIR + CIR Provisioned	#4MC
Max Registered MSs	#4NTk
Max Spectral Efficiency all MSs	#4SEM
Min Registered MSs	#4NTj
NE failure Ratio	#4NTg
Number Of Connected SUs	#4CS
Registered MSs Qty	#4019
Repetition Ratio	#4013
Repetitions	#4028
Sounding Resources	#4018
Sounding Resources utilization Ratio	#4010
Subscription Ratio	#4SR
Succeed Ho Attempts	#4029

Table 11-19: 4Motion BS Threshold Codes (Continued)

Code	Parameter
Succeed Ho Attempts Ratio	#4014
Succeed Initial NE	#4022
Succeed Initial NE Ratio	#4002
Succeed Transfer Ratio	#4011
Succeed Transferred Bursts Qty	#4026
UL Air Link Utilization, Data Zone	#4UU1
UL HARQ Packet Error Rate PER 16QAM 1/2	#4E06
UL HARQ Packet Error Rate PER 16QAM 3/4	#4E07
UL HARQ Packet Error Rate PER 64QAM 1/2	#4E08
UL HARQ Packet Error Rate PER 64QAM 2/3	#4E09
UL HARQ Packet Error Rate PER 64QAM 3/4	#4E10
UL HARQ Packet Error Rate PER 64QAM 5/6	#4E11
UL HARQ Packet Error Rate PER QPSK 1/2	#4E04
UL HARQ Packet Error Rate PER QPSK 1/2 Rep 2	#4E03
UL HARQ Packet Error Rate PER QPSK 1/2 Rep 4	#4E02
UL HARQ Packet Error Rate PER QPSK 1/2 Rep 6	#4E01
UL HARQ Packet Error Rate PER QPSK 3/4	#4E05
UL HARQ Packet Error Rate Total	#4E00
UL Noise (Median)	#4UN2
UL SINR Distribution, SINR 11dB till 15dB	#4SI4
UL SINR Distribution, SINR 15dB till 19dB	#4SI5
UL SINR Distribution, SINR 3dB till 7dB	#4SI2
UL SINR Distribution, SINR 7dB till 11dB	#4SI3
UL SINR Distribution, SINR > 19dB	#4SI6
UL SINR Distribution, SINR Below 3dB	#4SI1

11.5.4.2 NPU Codes

Table 11-20: NPU Threshold Codes

Code	Parameter
R3 CIR Throughput Oversubscription	#4NT8
R3 MIR Throughput Oversubscription	#4NT7
R3 Throughput	#4NT6
R3 Total CIR	#4NTa
R3 Total MIR	#4NT9
R6 CIR Throughput Oversubscription	#4NTd
R6 MIR Throughput Oversubscription	#4NTc
R6 Throughput	#4NTb
R6 Total CIR	#4NTf
R6 Total MIR	#4NTe
Registered MSs Qty	#4NTl
Service Flow usage Ratio	#4NTi
Succeed Initial NE	#4NTm
Uptime	#4UPT
cntNpuBckhlPort	#4NT5
cntNpuBearer	#4NT1
cntNpuCascPort	#4NT4
cntNpuExtMgmt	#4NT2
cntNpuIntMgmt	#4NT3

11.5.4.3 SU Codes

Table 11-21: SU Threshold Codes

Code	Parameter
Aggregated Throughput	#4SUa
MCS Avg	#4SU6
MCS Max	#4SU5
MCS Min	#4SU4
MS BF Ratio	#4SUe
MS Drop Ratio	#4SUg

Table 11-21: SU Threshold Codes

Code	Parameter
MS Dropped Bursts Qty	#4SUj
MS MIMO A Ratio	#4SUc
MS MIMO B Ratio	#4SUd
MS Repetition Ratio	#4SUh
MS Repetitions	#4SUk
MS Succeed Transfer Ratio	#4SUf
MS Succeed Transferred Bursts Qty	#4SUi
SINR Avg	#4SU3
Total Transferred Bursts	#4SUb
Uplink RSSI Avg	#4SU9
Uplink RSSI Max	#4SU8
Uplink RSSI Min	#4SU7

11.5.5 Default Built-in Reports

- BottomN Uptime
- TopN Air Link Utilization
- TopN Average Sector Throughput
- TopN Number of Connected SUs

11.6 BreezeMAX Extreme

11.6.1 Overview

- SW Compatibility - version 1.5
- Collector type - WiMAX Extreme

11.6.2 Network Discovery Prerequisites

Optional - registered as Authorized manager with traps disabled - according to BreezeMAX Extreme specifications.

11.6.3 Key Performance Indicators (KPIs)

11.6.3.1 BS KPIs

Table 11-22: Traffic Counters - BreezeMAX Extreme

Counter/Formula	Members	Description
CIR Allocated (Bits per Second) * BS_TOTAL_DL_CIR * 1000 ** BS_TOTAL_UL_CIR * 1000*	Downlink Uplink	Aggregation of maximum provisioned traffic of CIR services during the sampled 15 minutes period.
CIR Related Over-Subscription Ratio (%) * (BS_TOTAL_DL_CIR/ ((BS_DL_BYTES / BS_DL_USED_SEC * 8))) *100 * (BS_TOTAL_UL_CIR/ ((BS_UL_BYTES / BS_UL_USED_SEC * 8))) *100	Uplink Downlink	calculation of average actual traffic in respect to total provisioned CIR in %
Drop Ratio (%) * SUM(CPE_DL_DROP_BURSTS) / SUM(CPE_DL_TOTAL_BURSTS + CPE_DL_DROP_BURSTS) * 100 * SUM(CPE_UL_DROP_BURSTS) / SUM(CPE_UL_TOTAL_BURSTS + CPE_UL_DROP_BURSTS) * 100	Uplink Downlink	Ratio between number of dropped bursts and total bursts (dropped and succeeded) counted in the sampled period

Table 11-22: Traffic Counters - BreezeMAX Extreme (Continued)

Counter/Formula	Members	Description
MIR Allocated (Bits per Second) * BS_TOTAL_DL_MIR * 1000 * BS_TOTAL_UL_MIR * 1000	Uplink Downlink	Aggregation of maximum provisioned traffic of MIR services during the 15 minutes period.
MIR Related Over-Subscription Ratio (%) * (BS_TOTAL_DL_MIR/ ((BS_DL_BYTES / BS_DL_USED_SEC * 8))) *100 * (BS_TOTAL_UL_MIR/ ((BS_UL_BYTES / BS_UL_USED_SEC * 8))) *100	Uplink Downlink	calculation of average actual traffic in respect to total provisioned MIR in %
Number of Connected SU (Count)	Value	Number of SUs that have been connected to the BS, for the whole 15 minute interval proceeding the PMTM file generation.
Repetition Ratio (%) * (SUM(CPE_DL_HARQ_REPETITION) / SUM(CPE_DL_TOTAL_BURSTS))* 100 * (SUM(CPE_UL_HARQ_REPETITION) / SUM(CPE_UL_TOTAL_BURSTS))* 100	Downlink Uplink	Ratio between aggregated CPE HARQ repetitions to aggregated Total Bursts
Throughput (Bits per Second) * (BS_DL_BYTES * 8) / BS_DL_USED_SEC * (BS_UL_BYTES * 8) / BS_UL_USED_SEC	Downlink Uplink	Average sector throughput per BS (each measurement represents the average throughput of the passed sampling interval of 15 minutes).
Transfer Overhead (%) * SUM (CPE_DL_HARQ_NACK) / SUM (CPE_DL_HARQ_ACK) * 100 * SUM (CPE_UL_HARQ_NACK) / SUM (CPE_UL_HARQ_ACK) * 100	Downlink Uplink	Ratio between aggregated CPE HARQ NACKs to aggregated CPE HARQ ACKs

Table 11-22: Traffic Counters - BreezeMAX Extreme (Continued)

Counter/Formula	Members	Description
Transfer Ratio (%) * SUM(CPE_DL_TOTAL_BURSTS) / SUM(CPE_DL_TOTAL_BURSTS + CPE_DL_DROP_BURSTS) * 100 * SUM(CPE_UL_TOTAL_BURSTS) / SUM(CPE_UL_TOTAL_BURSTS + CPE_UL_DROP_BURSTS) * 100	Downlink Uplink	Ratio between aggregated CPE Total Bursts to aggregated CPE Total and Dropped Bursts.

11.6.3.2 BTS KPIs

Table 11-23: BTS KPIs

Counter	Members	Description
Uptime	Uptime	Time since last system boot in hours

11.6.3.3 SU KPIs

Table 11-24: SU KPIs

Counter	Members	Description
Rate Downlink/Uplink (Rate)	Min/Average/Max	Modulation Rate for each MS. The Min and max Rate sampled in the integration period of 15min. Average is calculated by dividing by number of samples
RSSI Downlink/Uplink (dBm)	Min/Average/Max	RSSI is sampled from each burst. Min and max RSSI value sampled in the integration period of 15min.. Average is calculated by dividing by number of samples
SNR Downlink/Uplink (dB)	Min/Average/Max	SNR Min and max SNR value sampled in the integration period of 15min. Average is calculated by dividing by number of samples
SU CIR Allocated (Bits per Second) * CPE_TOTAL_DL_CIR * 1000 * CPE_TOTAL_UL_CIR * 1000	Downlink Uplink	Aggregation of maximum provisioned traffic of CIR services for each CPE during the 15 minutes period.

Table 11-24: SU KPIs (Continued)

Counter	Members	Description
Su Drop Ratio (%) * CPE_DL_DROP_BURSTS) / (CPE_DL_TOTAL_BURSTS + CPE_DL_DROP_BURSTS) * 100 * (CPE_UL_DROP_BURSTS) / (CPE_UL_TOTAL_BURSTS + CPE_UL_DROP_BURSTS) * 100	Downlink Uplink	Ratio between number of dropped bursts and total bursts (dropped and succeeded) for each CPE, counted in the sampled period
SU MIR Allocated (Bits per Second) * CPE_TOTAL_DL_MIR * 1000 * CPE_TOTAL_UL_MIR * 1000	Downlink Uplink	Aggregation of maximum provisioned traffic of MIR services for each CPE during the 15 minutes period.
SU Repetition Ratio (%) * ((CPE_DL_HARQ_REPETITION) /(CPE_DL_TOTAL_BURSTS))* 100 * ((CPE_UL_HARQ_REPETITION) / (CPE_UL_TOTAL_BURSTS))* 100	Downlink Uplink	Ratio between CPE HARQ repetitions to Total Bursts
SU Throughput (Bits per Second) * CPE_TOTAL_DL_BYTES_TRANSFERRED * 8 / 900 * CPE_TOTAL_UL_BYTES_TRANSFERRED * 8 / 900	Downlink Uplink	Counts the bytes transferred and calculates the transferred rate normalized to the active frames MS transferred the counted bytes.
SU Transfer Overhead (%) * (CPE_DL_HARQ_NACK) / (CPE_DL_HARQ_ACK) * 100 * (CPE_UL_HARQ_NACK) / (CPE_UL_HARQ_ACK) * 100	Downlink Uplink	Ratio between CPE HARQ NACKs and CPE HARQ ACKs

Table 11-24: SU KPIs (Continued)

Counter	Members	Description
SU Transfer Ratio (%) * (CPE_DL_TOTAL_BURSTS) / (CPE_DL_TOTAL_BURSTS + CPE_DL_DROP_BURSTS) * 100 * (CPE_UL_TOTAL_BURSTS) / (CPE_UL_TOTAL_BURSTS + CPE_UL_DROP_BURSTS) * 100	Downlink Uplink	Ratio between CPE Total BURSTS to CPE Total BURSTS and CPE Dropped Bursts

11.6.4 Codes for Threshold Setting

11.6.4.1 BTS Codes

Table 11-25: BTS Codes

Code	Parameter
CIR Allocated	#eBSe
CIR related Over Subscription Ratio	#eBSg
Drop Ratio	#eBSb
MIR Allocated	#eBSf
MIR related Over Subscription Ratio	#eBSh
Number Of Connected SUs	#eCS
Repetition Ratio	#eBSc
Throughput	#eT
Transfer Ratio	#eBSa
Transfer overhead	#eBSd
Uptime	#eUPT

11.6.4.2 SU Codes

Table 11-26: SU Codes

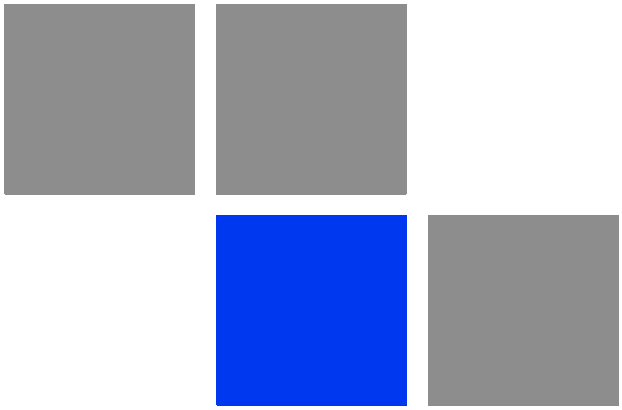
Code	Parameter
SU CIR Allocated	#eSUe
SU Drop Ratio	#eSUb
SU MIR Allocated	#eSUf

Table 11-26: SU Codes (Continued)

Code	Parameter
SU RATE AVERAGE	#eSU9
SU RATE MAX	#eSU8
SU RATE MIN	#eSU7
SU RSSI AVERAGE	#eSU6
SU RSSI MAX	#eSU5
SU RSSI MIN	#eSU4
SU Repetition Ratio	#eSUc
SU SNR AVERAGE	#eSU3
SU SNR MAX	#eSU2
SU SNR MIN	#eSU1
SU Throughput	#eSUg
SU Transfer Ratio	#eSUa
SU Transfer overhead	#eSUd

11.6.5 Default Built-in Reports

- BottomN Uptime
- TopN Number of Connected SUs
- TopN throughput



Glossary

The following terms are frequently used in this manual:

- **AU** - Access Unit
- **BS - Base Station**
- **BTS** - Base Transceiver Station
- **CIR** - Committed Information Rate
- **CINR** - Carrier to Interference-plus-Noise Ratio
- **CPE -** Customer Premises Equipment
- **Equipment** - the basic sampled unit. Two types of equipment are used in the StarQuality system:
  - **AU** /Slot/ BS/Sector (in TDD or FDD only)
  - **SU/CPE/MS**
- **HARQ -** Hybrid Automatic Repeated Request
- **MCS -** Modulation Coding Scheme
- **MIR -** Maximum Information Rate
- **MS** - Mobile Subscriber
- **NBI -** Northbound Interface
- **Public/Private** objects - Public objects (sites, etc.) are created by the admin user for the whole system. Private object are created by the local user for the local system only.
- **ROOT Site** - the basic system network site, under which you can create sites and virtual sites
- **RSSI -** Received Signal Strength Indication.
- **SINR** - Signal Interference Noise Ratio

- **SNR - Signal to Noise Ratio -**
- **SOAP** (Simple Object Access Protocol) - interface to enable various NBI operations via third party applications
- **Site -**
  - **Non-virtual** - A base station, containing up to 7 AUs, on which measurements are collected
  - **Virtual Site** - any collection of equipments, grouped by various subjects, such as areas
- **SU** - Subscriber Unit
- **XLS** - Excel file format